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# DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES APPROPRIATIONS FOR 1983

ORIGINAL

COMPLETED

## HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON THE DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES

SIDNEY R. YATES, Illinois, *Chairman*

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| CLARENCE D. LONG, Maryland | JOSEPH M. McDADE, Pennsylvania |
| JOHN P. MURTHA, Pennsylvania | RALPH S. REGULA, Ohio |
| NORMAN D. DICKS, Washington | TOM LOEFFLER, Texas |
| LES AuCOIN, Oregon | |

FREDERICK G. MOHRMAN, D. NEAL SIGMON, and KATHLEEN R. JOHNSON, *Staff Assistants*

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Printed for the use of the Committee on Appropriations

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# DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES APPROPRIATIONS FOR 1983

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TUESDAY, MARCH 9, 1982.

## DEPARTMENT OF ENERGY

### WITNESSES

**HON. JAMES B. EDWARDS, SECRETARY**
**ELIZABETH E. SMEDLEY, ACTING BUDGET DIRECTOR**
**JAN W. MARES, ASSISTANT SECRETARY FOR FOSSIL ENERGY**

### OPENING REMARKS

Mr. MURTHA [presiding]. The committee will come to order. Today we are pleased to have Secretary of Energy Edwards with us. We have studied your statement and it will appear in its entirety in the record.

Mr. Secretary, I see you have with you Assistant Secretary Jan Mares for Fossil Energy, and Elizabeth Smedley, the Budget Office's Acting Director, to make sure that we don't get out of line, I guess, in energy spending.

Secretary EDWARDS. She keeps me straight.

Mr. MURTHA. We will be glad to have you summarize your statement, or would you rather start with a question?

Secretary EDWARDS. Mr. Chairman, for the benefit of time, why don't we just submit it for the record and go directly to the questioning. They tell me that is a bad thing to do because you consume some of your questioning time by reading the statement but I will take a chance on it today.

[The biographies of Mr. Mares and Ms. Smedley and the statement of Secretary Edwards follow:]

U.S. Department of Energy
Speakers Bureau
Office of Public Affairs
Washington, D.C. 20585
202/252-9044

# BIOGRAPHY

JAN W. MARES
Assistant Secretary for
Fossil Energy

Jan W. Mares was nominated by the President to be the Department of Energy's Assistant Secretary for Fossil Energy on July 8, 1981. His nomination was confirmed by the U.S. Senate on July 28, 1981, and he was sworn in on August 12, 1981. In this position, Mr. Mares' major responsibilities include research and development of coal, petroleum, oil shale, tar sands and unconventional gas technologies.

Prior to his appointment, Mr. Mares' entire professional career had been with the Union Carbide Corporation. He joined the Corporation in 1963 and for 10 years was in the law department specializing predominantly in international, antitrust and commercial legal matters, and was appointed International Counsel in 1972. In 1973, he became business manager in Union Carbide's hydrocarbons department, responsible for the effort to develop a petrochemical project with an oil-producing country, and subsequently had various line and staff assignments in the chemicals and plastics area. He was named Vice-President-General Manager of the Ethylene Oxide Derivatives Division in January 1980.

Mr. Mares has been a Director of Energy Resources Co., Inc. of Cambridge, Massachusetts, and is a member of the American Chemical Society, American Bar Association, and New York State Bar Association.

Mr. Mares received a Bachelor of Arts degree in chemistry from Harvard College in 1958, a Masters' degree in chemical engineering from the Massachusetts Institute of Technology in 1960, and a law degree from the Harvard Law School in 1963.

Mr. Mares was born in St. Louis, MO, in 1936, and attended schools in Texas and Missouri. At the time of his appointment, he resided in New Canaan, CT, but has subsequently moved to Washington, D. C. He is married and has two children.

September 1981

**Department of Energy**
**Washington, D.C. 20585**

BIOGRAPHY

ELIZABETH E. SMEDLEY

ACTING BUDGET OFFICER

Mrs. Smedley came to the Department of Energy December 30, 1979, and is currently serving as Acting Budget Officer for the Department. Prior to her assignment to DOE, she spent four and one-half years as Head of the Operating Forces Branch within the Office of the Comptroller of the Navy where she was responsible for formulation, defense and execution of the portion of the Navy Budget which provided operating funds for the Atlantic and Pacific fleets. From 1964 to 1975 she served in positions of increasing responsibility with the Public Health Service, Department of the Army, Defense Communications Agency and Department of the Navy.

She has been active in community affairs and from 1969-1973 served in a part-time elected capacity as Councilwoman for the City of Bowie, Maryland.

Mrs. Smedley received a Bachelor of Arts degree in International Relations from Goucher College in 1964 and did graduate work in Business and Public Administration at George Washington University.

Mrs. Smedley was born in Baltimore, Maryland, on November 9, 1943, and currently resides in Fort Washington, Maryland. She is married to Jerry Morgan Smedley of Mishawaha, Indiana. They have four children.

## Statement of James B. Edwards
## Secretary of Energy
## Before the
## Committee on Appropriations
## Subcommittee on Interior and Related Agencies

Mr. Chairman, Members of the Committee, I appreciate the opportunity to discuss with you the Fiscal Year 1983 budget for Federal Energy programs.

This budget is structured to accord with the proposed reorganization of energy functions currently administered by the Department of Energy. The objective of this budget and reorganization is to continue the transition from an energy policy which has led to a costly, ever-expanding energy bureaucracy, to a policy which relies on the free market for solutions to many of our energy problems. We believe the free market has served us well in the past and will work in the future when it is allowed the freedom to do so.

Last year, our budget request focused on redirecting Federal support away from demonstration and commercialization activities that are better handled by the private sector in favor of the more traditional and appropriate Federal role of funding longer-term, high-risk technology research and development with a potentially high payoff. That trend is continued and further refined in the FY 1983 budget request. This realignment of budget priorities was accompanied by a major step toward freeing the marketplace with the President's action of January, 1981, removing all price and allocation controls from crude oil and petroleum products.

Our redirection in spending and the removal of over 200 burdensome, counterproductive regulations are the keys to this Administration's policy of placing more reliance on the private sector and the market to stimulate energy conservation, production, and the selection of new technologies for commercialization.

This policy is working well. Since the decontrol of oil last year, drilling and seismic work have reached all time peaks, and this year we expect to break those records. Oil imports are at the lowest level since 1975, a vibrant sign that conservation is working.

The FY 1983 budget request for energy programs has been developed to support the five basic responsibilities in energy which are unique to the Federal government:

- Establishing sound public policies which give individuals and business the incentive to produce and use energy efficiently and allow an integrated energy market to function;

- Protecting against energy supply disruptions, primarily through maintenance of the Strategic Petroleum Reserve;

- Providing support to long-term, high-risk, potentially high-payoff research;

- Supporting national defense needs through civilian control of research, development, production, and testing of nuclear weapons; and

- Performing other tasks, such as operation of Federal energy resource reserves and Federal Power Marketing Administrations, and utility regulation required by law.

- o Supporting national defense needs through civilian control of research, development, production, and testing of nuclear weapons; and

- o Performing other tasks, such as operation of Federal energy resource reserves and Federal Power Marketing Administrations, and utility regulation required by law.

There being no further role for the government in the petroleum marketplace and in the commercialization of energy technologies, it is no longer necessary to have a single-purpose Cabinet-level department for the management of energy matters. As was stated in the National Energy Policy Plan released in July, 1981, energy is no longer viewed as an isolated entity, but rather as an integral part of the overall economy. Consequently, the management of these five basic energy responsibilities can be carried out more efficiently and effectively in other Cabinet-level departments which are charged with major responsibilities in the management of the Nation's economy.

In the proposed reorganization plan, these responsibilities will be divided principally between the Department of Commerce and the Department of the Interior. Completion of petroleum regulatory enforcement and related activities will go to the Department of Justice, and the Federal Energy Regulatory Commission will become a separate, independent regulatory agency. The Department of Commerce will receive the bulk of the energy programs currently managed by the Department of Energy. A new agency, the Energy Research and Technology Administration (ERTA), will be established within the Department of Commerce to manage energy research and development, uranium enrichment, general science and defense activities. I am convinced that our security can be enhanced, our trade promoted, and our energy technologies advanced by combining these energy programs with the existing trade enhancement and technology development activities in the Department of Commerce.

The creation of ERTA will allow specialized management of the high technology energy, science, and weapons programs than was possible in the Department of Energy. This streamlined new organization will be able to focus necessary management attention on the difficult and unique set of problems that face high technology program development, and efficiency gains will result from the interrelationships of these programs.

Independent of ERTA, the Department of Commerce will also administer other energy functions, such as energy information collection and analysis, emergency preparedness activities, international energy activities, conservation grant management, and national energy policy. The Department of Commerce is particularly well suited to manage these programs because of its current information collection and statistical functions, its existing relationships with the business community and with State and local governments, and its national and international economic policy functions.

The Department of the Interior will manage Federally owned energy resources including the Strategic Petroleum Reserve, the Naval Petroleum and Oil Shale Reserves, and the five Power Marketing Administrations. The Department of the Interior's expertise in natural resource management makes it the logical recipient of these programs. In addition, certain mining research and development and related activities will transfer to the Department of the Interior's Bureau of the Mines.

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## BUDGET SUMMARY

The FY 1983 budget request for Federal energy programs is $11.8 billion in budget authority, including $2.1 billion in off-budget oil acquisition funds for the Strategic Petroleum Reserve. The anticipated outlays are $12.2 billion. This is a decrease of $1.3 billion in budget authority from FY 1982. Areas where requested funding is reduced include Energy Research and Development, the Strategic Petroleum Reserve, and Program Administration. Other major activities have increased funding requirements, including Atomic Energy Defense Activities, General Science, and the Power Marketing Administrations.

I would like now to discuss the funding request for selected major program elements.

## RESEARCH AND DEVELOPMENT PROGRAMS

As mentioned above, the proposed reorganization plan transfers research and development programs to the Energy Research and Technology Administration (ERTA).

These activities, which represent 27 percent of the overall budget in FY 1983, show a 14 percent reduction from FY 1982. This reduction is a continuation of the redirection begun last year of the fossil, conservation, solar and renewable resource programs away from expensive technology demonstrations in favor of long-term, high-risk, potentially high-payoff research and development.

I will discuss certain of these technologies in greater detail.

## MAGNETIC FUSION

Our efforts in fusion energy are directed toward a breakthrough that would provide us with a potentially inexhaustible energy resource base. The FY 1983 budget request of $444.1 million will provide for continuation of our scientifically oriented fusion program with a limited engineering effort. The plasma confinement effort will be aimed at pursuing mainline tokamak and mirror concepts. The Tandem Mirror Experiment Upgrade at Lawrence Livermore Laboratory will be operating and construction of the Tokamak Fusion Test Reactor project at the Princeton Plasma Physics Laboratory will be completed.

Funds are also proposed to fabricate an Advanced Toroidal Facility at Oak Ridge National Laboratory and improve the capability of the existing Doublet III machine to provide the research tools necessary to address the physics issues in present and advanced toroidal concepts. Funding is also proposed to continue construction activities on the Mirror Fusion Test Facility-B at Livermore.

## NUCLEAR FISSION

The Nuclear Fission program provides the research base for the continued development of nuclear power as an economic and environmentally acceptable source of electric power. The FY 1983 budget request is $1,016 million.

The FY 1983 budget request for the Breeder Reactor Systems program is $577.5 million. In mid-FY 1982, in support of the President's Economic Recovery Program, we will begin to streamline certain aspects of the Liquid Metal Fast Breeder Reactor (LMFBR) program. This is necessary so that the resources, facilities, and technical expertise can be used in the most cost effective manner. The breeder base program will continue to support technology development on fuels, materials, and structures.

The principal plant project included in the LMFBR program is the Clinch River Breeder Reactor (CRBR). In FY 1983, it is anticipated that site preparation activities will move forward as well as the required licensing support, design work, and equipment procurement and fabrication activities.

Emphasis is also placed on closing the nuclear fuel cycle, principally by continuing research on commercial reprocessing of spent fuel, and on nuclear waste disposal. The Administration is committed to the development of commercial high-level waste repositories. To finance repository activities, we propose that a Nuclear Waste Disposal Fund be created into which fees will be paid by utilities which use nuclear power to generate electricity. In FY 1983, borrowing authority of $185 million is requested to provide program continuity early in the year, until fees are collected from the utilities later in the year. It is estimated that $300 million in fees will be deposited in the fund in FY 1983.

## BASIC ENERGY SCIENCES

The purpose of the Basic Energy Sciences (BES) program is to provide knowledge that is relevant to energy production, conversion, exploration and use.

In FY 1983, the budget request of $283 million will enable the program to maintain most of the ongoing core research program and will permit some growth in biological energy research, advanced energy projects, engineering, mathematics, and geosciences. In addition, the BES program will continue to operate a network of research facilities at the National Laboratories as a national trust.

In FY 1983, the BES program will support research using major facilities such as the National Synchrotron Light Source at Brookhaven National Lab, and the Combustion Research Facility at Sandia Laboratories. Funding is also provided for modifications of the Weapons Neutron Research Facility at the Los Alamos Scientific Laboratory, which will be the first in a new generation of neutron sources for civilian research. In FY 1983, this program will assume the responsibility for operation of the Stanford Synchrotron Radiation Laboratory, formerly funded by the National Science Foundation.

## FOSSIL ENERGY

This Nation still has abundant domestic resources of coal, oil shale, natural gas and petroleum. As a result of the Administration's action last year to decontrol the price of oil, government subsidies and regulations which reduced production and encouraged oil imports have been abandoned, and free market forces have greatly increased the attractiveness of domestic energy investments.

The Fossil Energy budget request reflects this changing role of the Federal government. The process began last year, when the Fossil Energy budget was realigned to concentrate on long-term, high-risk research and development, while relying on the private sector to demonstrate and commercialize promising individual technologies and processes. In FY 1983, funds will be applied to more generic research efforts and technology base development.

The budget request for these activities is $107 million. Of this figure, $91 million is for the Coal program. Almost 50 percent of the budget request for Coal is devoted to the Advanced Research and Technology Development and Coal Liquefaction programs, with lesser amounts earmarked for work in the areas of coal gasification, fuel cells, environmental control technology and coal preparation, direct combustion, and mining research and development.

In the Petroleum program, the FY 1983 effort will concentrate on enhanced recovery of light and heavy oil, and chemistry and physics work and environmental mitigation efforts in oil shale. In addition, the advanced exploratory research activities, which provide generic and fundamental support to all petroleum programs, will continue. The budget for petroleum activities is $16 million.

## CONSERVATION

Efficient energy use is in everyone's economic interest. Rapid increases in energy costs have fostered substantial conservation efforts by individuals, businesses and other institutions in the past few years. The President's action to immediately deregulate crude oil and petroleum product prices in January 1981 has done much to free the market and accelerate this process. Consequently, a major Federal conservation program is no longer necessary.

Conservation Research activities will concentrate on fundamental research designed to build a technology base that can provide the foundation for future development of commercial products by the private sector.

In FY 1983, research and development funding of $17.5 million will be concentrated in the Multi-Sector Energy Conversion and Utilization Technology program area. The results of research performed there will be made available directly to the private sector, rather than being utilized by government technology applications programs serving specific end-use sectors, as was the case previously. The market forces which are behind the impressive nationwide conservation efforts render these intermediate technology application activities unnecessary beyond FY 1982.

The State and local assistance programs, which include grants for Weatherization and Schools and Hospitals, are proposed to be terminated, together with support for appropriate technology and energy-related inventions. The budget request of $4.3 million will fund the personnel required for monitoring and termination of activities relating to final grants awarded in the previous year. This activity will be housed in the Department of Commerce, but not within ERTA. The FY 1983 Budget would still provide Federal funds to the States for weatherization through the Low-Income Home Energy Assistance Program administered by the Department of Health and Human Services and through the Community Development Block Grant Program administered by the Department of Housing and Urban Development. Continued Federal support for the appropriate technology and energy-related inventions programs can no longer be justified in an economic climate so conducive to private support for energy conservation.

## SOLAR AND OTHER RENEWABLE ENERGY

Solar and Other Renewable Energy resources offer the potential for significant contributions toward achieving energy self-sufficiency over the long term. The FY 1983 funding request for these programs totals $83 million.

The Administration's policies for solar energy continue the redirection begun last year to place greater emphasis on the private sector in the development and commercialization of solar technologies. The free market will determine the development and introduction rates of solar technologies consistent with their economic potential. A number of new technologies have been developed in recent years, and it is time that they be tested in the marketplace.

Consistent with this policy, no new FY 1983 budget authority is being requested for Active Heating and Cooling, Passive Heating and Cooling, Ocean Thermal Energy Systems, Hydropower, and Solar Information programs.

The Photovoltaics program budget request of $27 million is directed toward advancing the technology base upon which private industry can develop photovoltaic energy systems. Basic research activities will continue in the Solar Thermal, Biomass, and Wind Energy program areas, and the request of $9.5 million for Solar International activities will complete our Government's commitment to the Saudi Arabian Government under the Cooperative Project Agreement for jointly funded solar energy research and development.

The overall strategy of the Geothermal program is to conduct generic and technology base research. Consistent with this strategy, the $10 million FY 1983 geothermal program is structured around three areas: orderly termination of the hot dry rock program, completion of government involvement in the geopressurized resource definition program, and performance of research and development in the areas of geochemistry, geoscience, and energy conversion with particular application to lower-temperature resources.

## GENERAL SCIENCE

The programs included in the General Science appropriation support basic research to expand our knowledge of the fundamental structure and behavior of matter. The budget request for FY 1983 is $601 million, up from $543 million in FY 1982.

The High Energy Physics Program shows the largest increase. The FY 1983 budget request of $429 million is almost 18 percent above the previous year's funding. One of the major activities in FY 1983 will be the commissioning and initial operations for research of the Energy Saver Superconducting Synchrotron at Fermi National Accelerator Laboratory. Priority is also given to operation of the Positron Electron Project Colliding Beam Facility at the Stanford Linear Accelerator Center. There will be a significant accelerator R&D program at Brookhaven National Laboratory on superconducting magnets, which are a high priority need for the future of the U.S. High Energy Physics Program.

## DEFENSE ACTIVITIES

Defense Activities support the national security mission of the Department of Defense through the development, testing, and production of nuclear weapons and materials. The increase in funding from $4,692 million in FY 1982 to $5,506 million in FY 1983 is principally related to increased production requirements of weapons systems as outlined in the President's Nuclear Weapons Stockpile Memorandum.

Funding for full scale production of eight types of weapons will be requested, and weapon research and development efforts will also increase. Materials Production funding shows an increase commensurate with production requirements and the continuation of capital improvement projects.

The Defense Waste Management program also shows a substantial increase, from $365 million in FY 1982 to $518 million in FY 1983, with the largest increase in Terminal Storage to improve our current and future storage capacity. The Waste Isolation Pilot Plant project and the Defense Waste Processing facility - a glassification project - will be continued in FY 1983.

## STRATEGIC PETROLEUM RESERVE

The total funding request for FY 1983 is $2,316 million, $2,074 million of which is off-budget for oil acquisition and transportation. As a result of limitations on available permanent storage capacity and, further, as a result of revised oil price assumptions, this funding level is well below FY 1982's $3,875 million, which included $3,684 million off-budget for oil acquisition and transportation. The total available capacity of the Reserve will be filled by the end of FY 1983 to a cumulative capacity of 343.1 million barrels.

New authority of $222.5 million is requested in FY 1983 for facilities development. As a result of accelerated leaching of the Bryan Mound caverns and other factors, storage capacity in the near term is being developed faster than previously anticipated. However, deferral of $53 million in FY 1982 funds is being proposed as part of a one year stretch-out of the completion of the 750 million barrel system. This will have no effect on available storage capacity prior to 1987.

## ENERGY REGULATION

Energy regulatory activities include the work of the Federal Energy Regulatory Commission (FERC), which becomes a separate, independent agency under the proposed reorganization plan, and the duties currently being performed by the Economic Regulatory Administration (ERA) and the Office of Hearings and Appeals (OHA).

In FY 1983, the FERC budget request is $92.5 million, to be partially offset by approximately $60 million from fees and other charges, assuming favorable consideration of the FERC user fee legislation by the Congress. The duties of the ERA and OHA will be divided between the Departments of Justice and Commerce under the reorganization plan. The Department of Justice will carry out the greater part of the adjudicatory activities of the OHA, as well as the petroleum regulatory compliance program, which seeks to identify and obtain redress for violations which occurred during the period when price and allocation controls were in effect on crude oil, residual oil and refined petroleum products. The budget request for the Department of Justice's energy regulatory activities is $18 million. We believe this funding level will be adequate to support a vigorous enforcement effort. As has been said many times before, there will be no amnesty for those who have obtained unlawful benefits.

The Department of Commerce and the Federal Energy Regulatory Commission will exercise the remaining responsibilities of the OHA and the oil and gas operations program currently housed in ERA.

## DEPARTMENTAL ADMINISTRATION

Funding requirements for Departmental Administration overhead activities are reduced in FY 1983, due largely to a decline in the number of Federal employees resulting from the elimination of unnecessary energy activities and the reduction of overhead anticipated with the elimination of the Department of Energy as a cabinet level organization.

Also, certain policy and management personnel once budgeted for in Departmental Administration are now proposed in the budgets of the operating activities they support. The budget request for FY 1983 is $162 million, compared to $267 million in FY 1982.

Mr. Chairman, I believe the FY 1983 budget request for Federal energy programs will permit us to carry out those essential energy tasks which are unique to the Federal Government, while leaving the remaining energy responsibilities to the genius and energies of the American people.

### FISCAL YEAR 1983 BUDGET REQUEST

Mr. MURTHA. The budget highlights document for the Federal energy programs in fiscal year 1983 states that the fiscal year 1983 budget request and reorganization proposal will strengthen and focus our efforts in energy policy research, weapons production, strategic and emergency planning and international trade. In view of the proposal to disburse energy programs to several Departments and reduce fossil and conservation budgets, how does your plan strengthen and focus the Federal energy effort?

Secretary EDWARDS. Well, since we have deregulated oil I think that we have done away with a lot of those aspects of the Department that we don't need any more and we have reduced the basic fundamental research from the commercialization type development and research that we had in the past to a basic long-term, high-risk, technology-based research which is more in keeping with the philosophy of this Administration.

So, from that standpoint, I think we have strengthened our weapons program. Our weapons program we have strengthened by placing more dollars into that program. Our strategic petroleum reserve program, we have pushed on that and I think we can have a well balanced program there. Basically these are the three areas that we have put a lot of emphasis on.

### BUDGET PRIORITIES

Mr. MURTHA. Would you explain why the budget activities for the demonstration of the breeder reactor and other nuclear activities are being maintained with high levels while the fossil energy request is only 20 percent of the fiscal 1982 program and conservation programs only 5 percent of the 1982 program?

Secretary EDWARDS. Well, we think that conservation is being driven by the price and we are conserving. And it might interest the committee to know that we have conserved seven times more energy than we have found in new proven reserves in the recent couple of years. But we feel we don't need to place a whole lot more as far as direct expenditures in conservation. In the last 4 weeks, for example, we have imported fewer barrels of oil per day than we have in the last 10 years. We are down to four million barrels a day this past 4 week recording period and that proves, I think, that conservation is taking place. So I think that we don't need to place a lot of money in conservation.

In our nuclear program, the Administration is solidly on record as being in favor of renewing the nuclear option. If we are going to do that we have to have a breeder program.

The present nuclear policy statement clearly defines that the President is interested in renewing that nuclear option and I think that in addition to the Clinch River Breeder reactor it is a logical next step and then, following that, I think we are going to have to move to the large development reactor.

The French, for example, have taken over our technological leadership and one of the reasons that they have is that they buried some of their waste, they are reprocessing. They have a breeder program going. They are developing further into the Super Phenix.

So I think that is an example of what can be done but we feel very strongly that we have got to renew that nuclear option and part of it is the Clinch River Breeder reactor and the follow-on fast metal breeder technology.

These are some of the reasons that we feel that those programs must be reinforced.

### ENERGY CRISIS

Mr. **Murtha**. Mr. Secretary, is it your opinion that the energy crisis is over?

Secretary **Edwards**. Not at all, not by any stretch of the imagination. And that is one of the things that worries me, Mr. Chairman, that we may be locked into a false sense of security now that things have eased up a little bit. One of the things that bothers me, is that if the price falls to a certain point, it may not be a driving force to develop and find new sources of energy both in the oil and gas industry and also in synthetic fuels development. So that is one reason I think why we should push hard to develop new sources of energy. And we also think that fossil fuel can more or less stand on its own. The commercialization of fossil fuel is pretty well documented. There is a lot of activity in that area but we have got to develop every source of energy we can, including nuclear.

### NUCLEAR VERSUS NONNUCLEAR RESEARCH

Mr. **Murtha**. I have been a strong supporter of nuclear energy. As a matter of fact, my record is so supportive of nuclear energy, that in the coal fields the coal unions get upset. They feel like it is competing.

Now it looks to me like we have an imbalance of the programs. In other words, you are talking to an individual who has a 100 percent record in supporting nuclear power. But I come from an area that produces half the coal in Pennsylvania and the coal miners are laid off and the coal companies are saying to me, Why are we not going to spend any money on coal research? They are really concerned about this imbalance.

Why is it that nuclear investment research is important and yet nonnuclear research we are reducing? That seems like there is a terrible imbalance there.

Secretary **Edwards**. Well, I think there are several reasons for it. One of the reasons is the nature of nuclear that came up through the weapons program. They do have severe environmental problems that have to be controlled, regulations have to be more severe in that area. But when you look at coal, you are looking at some projections that there is going to be an increase in coal and nuclear. We need both of them.

Mr. **Murtha**. I agree with that, but I think that you are presenting an imbalance, which seems to me, to favor nuclear energy. It does favor nuclear energy versus fossil fuel and versus coal. That is what concerns me.

## SYNTHETIC FUELS CORPORATION

Secretary **Edwards**. Well, we have tax incentives to push the R&D and development of coal. We also have the Synthetic Fuels Corporation that has $17 billion in the alternative fuels production funds. We have those programs so that we don't overlook the total spectrum in favor of one narrow part of it. But I think the Synthetic Fuels Corporation efforts will provide for coal development and oil shale development. So we have not overlooked coal in its entirety.

There is going to be a tremendous increase in the production of U.S. coal for domestic use and export, I think, from 830 million tons this year to 1.2 billion by 1990.

So you see, the use of coal is increasing and we need to do that. But I think the private sector can do most of that in coal.

## BREEDER REACTOR TECHNOLOGY

The breeder is a long-term, high-risk piece of research and you have got to have a breeder in place to really learn those things that are necessary, the technology to push that through. If we can solve the problem of commercialization of the breeder, we will have enough electricity for the free world for the next two or three thousand years if we can prove that commercially reliable. So you also have the benefit that you get out of the program that you have to weigh against the investment.

Mr. **Murtha**. In your budget statement, the 1983 Executive Budget, you say, "With decontrol of oil and natural gas prices, businesses no longer need additional investment incentives for energy conservation and the development of alternative energy sources."

Secretary **Edwards**. As I interpret that, that means that there is enough incentive there to drive them to do it on their own without Government direct subsidies.

Mr. **Murtha**. But that is not true in nuclear power?

Secretary **Edwards**. Well, to some extent it is true but you have to break nuclear up into several different categories. The light water reactor program, it is true in that program where the private sector put between $130 and $150 billion into the construction and operation of light water reactors.

Breeder reactor technology is not fully developed yet and so we need to continue funding that until we get it closer to a commercializable state.

We have got a tentative agreement on the part of the private industries if we can carry the follow-on breeder, if we can get the Clinch River Breeder reactor going and carry the large development project to the point where it can be licensed, the private sector will pick that up and build that large follow-on reactor. But they certainly are not going to build the Clinch River Breeder Reactor. They are participating in it to some extent. They have been knocked around so long and it has been postponed so many times that the private sector is beginning to wonder how much longer they can——

Mr. **Murtha**. Mr. Secretary, I hope I can interpret your testimony to mean that you support the Synthetic Fuel Corporation and the funding proposals for the Corporation.

I have met with the Chairman a number of times and I am impressed that he is following the dictates of law.

I agree that we are not over this energy crisis. I am concerned about the same thing you are that we are lulled into a position that we cut back on the basic things the Government should do and end up with an oil embargo or another cutback when we still have not come near to solving our problems.

Secretary **Edwards**. We are starting the same old cycle over again is what we are doing, unfortunately.

### FUNDING OF NUCLEAR VERSUS NONNUCLEAR RESEARCH

Mr. **Murtha**. If one assumes that it is necessary for the Government to fund a breeder and later reprocessing the nuclear fuel as well as waste storage as you would argue, why isn't it necessary to assist conservation fossil and solar technologies in the same manner?

Secretary **Edwards**. Mr. Chairman, I must challenge that because I am in favor of each of the utilities charging a sufficient amount to take care of their waste and there are a couple of bills before Congress right now that have to do with the funding of the waste and I certainly think that those who enjoy the benefits should pay for the waste. If we can get one of these bills passed that requires the utilities that generate electricity from nuclear energy to pay one mill per kilowatt hour generated, then we can fund the reprocessing and the burial of these wastes. So I am certainly in favor of that. I am not in favor of the Government paying for all those.

Now, the Government, by law, is charged with the responsibility of building the repositories and they have utterly failed in that area. But I just wanted to correct the record there.

We really are not in favor of exactly what you are saying Now I am in favor of the breeder reactor because that is a long-term research program and once that breeder reactor has been proven commercializable, if that is a good word, then we ought to turn it over to the private sector and let them do it.

Mr. **Murtha**. You are not saying as Secretary Fisk said, that one reason to keep the breeder reactor going is that we have already spent $1.2 billion and it is too late to stop?

Secretary **Edwards**. Well, I think that is an argument to continue it in a way because if you are going to get your investment out you should go ahead but that is not the whole reason. The reason is we need the technological base to use to go and move to the next logical step of a larger breeder reactor to compete internationally. The French have the Phenix and now they are moving to the Super Phenix.

The Clinch River Reactor is a 375-megawatt electric operation and we need a thousand megawatt operation with large follow-ons. So it is just a research tool to get this technology on line so we can generate electricity using plutonium.

As you know, the breeder generates more fuel than it uses so it seems logical to me that because you and I agree that the crisis is not over here is another opportunity for us to go to help fill in the gap between now and the time we develop fusion.

Mr. **Murtha**. Well, I was concerned about Secretary Fisk's statement, because we spent $200 million in SRC-I. It just did not seem logical to use that as a basis for continuing the project. So that is only a minor part of the argument to continue the Breeder reactor which I favored and voted for.

### FUNDING FOR MAGNETOHYDRODYNAMICS (MHD)

According to the Sunset Review Summer Report, on page 19, institution and economic factors have discouraged utilities from making the higher initial capital investment that a nuclear plant requires. Do these same institutional and economic factors not discourage utility development of MHD, fuel cells and pressurized fluidized beds?

Secretary **Edwards**. I think some of the factors do, but in these others you don't have the regulatory changes that have been made in the nuclear aspect. It gives some minor advantages but MHD does not give you tremendous advantages over some.

If you wonder why we have not continued MHD, we could address that specifically. It doesn't give us that much more of an advantage over the proven technologies like pressurized fluidized bed, combined cycle technologies and it does not open our new resource, for example, like fusion, where with fusion we can get energy from sea water.

The MHD is going to require maybe a 300-, 350-megawatt plant that will cost about $500 million in the next few years to really prove the feasibility of the technology. And when we have a $107 million fossil energy budget there is just no way that we can continue to fund the MHD to the proof of concept.

Mr. **Murtha**. Mr. Secretary, where is the money going to come from, that is what really concerns me? We cut the fossil energy R&D budget back from $1 billion in 1981 back to $400 million in 1982 and now, your 1983 proposal is down to $100 million. Small operators have no possibility of spending any money on research. The larger ones don't even have the ability, at least that is what they tell me, to spend money on research. It just seems to me we are going backwards in the coal research field and I have a great concern.

We are spending so much in nuclear power and nuclear research and not near enough on MHD which admittedly may not have as much prospect. There has been a great debate for years about MHD in this committee, but it seems to me that it does now have some prospects of success and nobody is going to spend the money if the Government doesn't.

Secretary **Edwards**. You know, at a time when we are trying to find ways to balance this budget and cut down our deficit, you have got to set priorities and make choices between technologies that we are going to continue to investigate.

So we have made those choices to the best of our ability and they may not be the perfect choices but they are at least choices that we find ourselves required to work within.

If we were not in the economic times we are in where we are trying to reduce our deficit then magnetohydrodynamics would be one of those things that we would probably invest the $500 million necessary to build the plant. But with the situation the way it is today it is extremely difficult for us to go ahead and recommend that we continue it when we are trying to cut down everywhere we can.

So it is just a choice of what we cut out and what we don't.

### OIL PRICES VERSUS OIL PRODUCTION

**Mr. MURTHA.** The Secretary of Defense and I have been advocating delaying the tax cut. Last year I predicted that if we did not delay those tax cuts they would start cutting defense and he didn't believe me last year but now he sees that my prediction is going to be absolutely accurate. The American people are so upset about the domestic cuts that they now want defense to be cut. So, I am advocating that defense probably will have to be cut back some but the tax cut, if delayed, will give us enough revenue to take care of some important projects like fossil energy research, which I am so distressed about being cut back so much.

The Administration's position is that decontrolled oil prices and rising natural gas prices will stimulate the marketplace to produce more oil and to increase conservation. Have you made any projections of the overall supply effect of these actions?

**Secretary EDWARDS.** We have not really in a scientific way but we do know that with the deregulation that the conservation side is working.

As I pointed out before we are at a 10-year low of imports and most of that is due to conservation. It is not the production side. The production side does not show as much action as the conservation side.

If you look at the charts on our production, you will see a gradual decrease in the production of oil in the United States since the seventies. Since deregulation, we have had a tremendous increase in activity out in the oil field.

We have had the greatest number of seismic crews, 744, I think, this past year. We had about 4,520 oil rigs in operation at the end of 1981, the greatest number in the history of the country. And for the first time last June, instead of this line continuing to fall, you saw a little flattening out and just a start of a little upturn in the production of oil. So from that standpoint I think we can say that we do see some results of what we are talking about.

All of this is price-driven. Now that the price has fallen, a lot of analysts are talking about $22 to $25 per barrel of oil. It costs almost $22 a barrel for a company to build a barrel of proven reserves. Then when you start getting down in price there is not that much margin to drive companies to go out and find new proven reserves and that is one of the things that worries me.

It is a mixed blessing this thing of the falling oil prices. On the one hand we certainly should be very pleased with it. But, on the other hand, it is going to have an effect upon our production. So I have mixed emotions about it.

Mr. **Murtha**. If prices had stayed up, would you be able to project what the production of oil might have been in another year in domestic production?

Secretary **Edwards**. I think we could have; yes.

Mr. **Murtha**. Do you have a figure that you can put in the record?

Secretary **Edwards**. Well, we just got the reports back. I think in 1980 production is just about stable, maybe just a little turnup. We will get you a figure for that.

Jan, do you have a figure?

Mr. **Mares**. I don't have it with me.

[The information follows:]

### Oil Production and Oil Prices

Domestic oil production in 1981 averaged about 8.6 million barrels per day, excluding natural gas liquids. In our analysis, higher oil prices stimulate exploration and development activities that result in higher oil production in later years. The instantaneous effect of price changes on domestic oil production, however, is estimated to be small. Consequently, if oil prices had remained as high in 1981 as had been projected, domestic oil production would have been only slightly higher in 1981 than actually occurred (i.e., less than 40 thousand barrels per day and not measurable using our techniques of analysis). In later years, however, the cumulative effect on oil production under higher oil prices could be quite significant.

Mr. **Murtha**. Is this increase in drilling for exploration or development?

Secretary **Edwards**. Both. It is right interesting. The independent oil companies are the ones that are doing the vast majority of the exploratory drilling, the wildcatters who are the independents. The large oil companies are not doing that much exploration. It is an interesting observation.

Mr. **Murtha**. And you feel if the price comes down to $22 a barrel——

Secretary **Edwards**. We are not going to have the exploration that we have had in the past.

### DOMESTIC PRODUCTION VERSUS OIL IMPORTS

Mr. **Murtha**. The low price will reduce exploration and then our imports of oil will start going back up again. Is that what you see happening?

Secretary **Edwards**. That is what I see happening. That is what happened before, you know. Back in the earlier days our domestic production was rather expensive and all of a sudden they discovered these large finds out in the Middle East where we could get oil for $1.50 and $2 a barrel so why go to the expense of developing our domestic resources when we could get all the oil we wanted for $2 a barrel. And the same thing, to a lesser extent, at a higher level of cost is going to happen again.

Mr. **Murtha**. Well, that is the thing that worries me. With the instability and the possibility of a war in the Middle East, if we were to be cut off from that source it would be absolutely disastrous. That is one of the reasons I supported the work in nuclear power but I certainly am distressed that you cut back the fossil fuel budget so drastically.

Secretary **Edwards**. There is some encouragement, however, when you look at the number of wells drilled. I am just talking from memory now but 80 percent of all the wells drilled have been drilled in the northern hemisphere since the beginning of drilling and 50 percent, according to the U.S. Geological Survey, of all the oil and gas resources remaining in the world are in the developing countries where only 5 percent of the drilling has ever taken place.

A lot of these developing countries are being drained of their resources for energy and we see some signs that they are becoming more willing to change their economic situation and political situation to invite foreign capital in to help them develop their own resources and a lot of that is taking place.

There is a lot more non-OPEC oil and gas being found out there than ever before. So that is an encouraging part of the equation.

Mr. **Murtha**. Mr. Loeffler has some questions.

### DEREGULATION OF NATURAL GAS

Mr. **Loeffler**. Following on that line, I commend you for your leadership on the success that we have had as a result of oil decontrol and also on the work that you put forward in an effort to expedite congressional activity on deregulation of natural gas.

With the same mood but in a different vein, I am disappointed that Congress has been unwilling to move ahead on deregulation of natural gas because what we may well find ourselves in is the reinvention of the wheel that occurred in the fifties and sixties and then in 1973 the spokes broke, the wheel went flat and we have struggled ever since to overcome our own problems domestically.

### COMPLIANCE PROGRAM

I would like to follow along the line of oil decontrol. I recognize, Mr. Chairman, that there are some questions later but we are dealing with oil. First of all, I agree with the budget reduction concerning the efforts to clean up and to reach a final conclusion on the alleged violations of price and allocation regulations in the past. I wonder if you might give us a brief report on where that stands. Would you also comment on what you may feel personally or as the Secretary of the Department of Energy concerning the statute of limitations for filing claims for those in the oil and gas arena. This has been going on now since 1974 and it is time to call everything to an end.

Could you give us a status report and then basically your guidance to us on what we should do?

Secretary **Edwards**. Well, basically, you can break it down into three different groups, the major refiners, the smaller companies and the crude oil resellers.

In the major refiners, all the audit work has been completed. Twenty-one of 35 have reached settlement and the 14 remaining companies are in the discussion process, discussing the possibility of settlement and we hope that those will all be settled by September 30th.

The small refiners, the product resellers, the retailers and the crude producers make up the largest group of unfinished cases. Most audits within that group have been completed we are trying to bring about settlement in most of those cases and hope to settle those by September 30th also.

The crude oil resellers are behind the other two categories. We have about 250 of those cases and enforcement actions are being taken on those cases and we hope to complete them by the end of fiscal year 1983.

So basically, the oil cases will be settled or in litigation and audits may be continued in some special investigations where there is willful fraud violation and we will refer those over to the Department of Justice.

We have $33 million in the compliance account, I think, in 1982 and in 1983 we have requested $14 million. For the Office of Hearings and Appeals there is a $4 million request plus a $2 million budget request for administrative support for a total of $20 million. I am very pleased with how this program is going.

Mr. **Loeffler**. I have no sympathy for anyone who violated the law, but at the same time, the second category that you talked about, including the independents, in my judgment there was great harassment and auditors were sharpshooters without targets.

I would like to ask you are there any other activities to go in and audit? Have you completed your audit targets or are you still looking at further audits?

Secretary **Edwards**. I will have to check that because I don't want to mislead you but it is my understanding that all the audits have been begun and we hope to have them completed by September 30, 1982.

Mr. **Loeffler**. What about your feeling about a statute of limitations for filing claims?

Secretary **Edwards**. I think I would want to ask my General Counsel that question. If you want an answer I can submit it for the record but not being a legal beagle myself, I would prefer to refer that to the lawyers in my Department. We can get that answer for you.

[The information follows:]

### STATUTE OF LIMITATIONS ON GOVERNMENT ENFORCEMENT OF THE EMERGENCY PETROLEUM ALLOCATION ACT

The Temporary Emergency Court of Appeals has ruled that there is no specific Federal statute of limitations on civil actions that the Department of Energy brings to enforce the Emergency Petroleum Allocation Act under section 209 of the Economic Stabilization Act. That court also held that State statutes of limitations are not applicable to such actions. *Citronelle-Mobile Gathering, Inc.* v. *Edwards* ——F.2d ————, 3CCH Federal Energy Guidelines ¶26,354 (TECA 1982).

Mr. **Loeffler**. Thank you, Mr. Secretary.

Thank you, Mr. Chairman.

Mr. **Murtha**. Mr. Secretary, there have been some reports that the Administration has a reserve of about $500 million that can be added to the 1983 budget of various energy programs if needed to "buy off" key Members of Congress to support dismantlement of the Energy Department.

Would you comment on these reports?

Secretary **Edwards**. Mr. Chairman, if that is the case I have not heard about it.

Mr. **Murtha**. Well, I wanted to get on that list, Mr. Secretary. We have a few projects I am interested in for the budget.

Secretary **Edwards**. If you will submit that list, Mr. Chairman.

### IMPEDIMENTS TO PRIVATE SECTOR R. & D.

Mr. **Murtha**. The January 25, 1982, issue of Fortune magazine has an article entitled "The Right Remedy for the R&D Lag." One of the problems the article identifies is the failure of the market system to fully reward innovators for their contribution. That is, a company can't keep secret results of its research. How does the Administration's program deal with this problem?

Secretary **Edwards**. I would like to submit that in writing for the record. I really haven't given it any thought nor have I ever discussed it. This is the first time it has been brought to my attention. The law on trade secrets has been the method available traditionally to protect proprietary information. But I don't know if the research that comes out of there, the person that does the research how is he protected vis-a-vis the Federal Government's interest in the research? Is that basically the question?

Mr. **Murtha**. Yes, and also the possibility of an individual switching firms and taking the technology with him or her.

Mr. **Mares**. From my standpoint I don't understand the nature of the problem that is being described. I don't think that there has been any change but I don't perceive a problem.

Mr. **Murtha**. Well, answer the question, if you will, for the record.

Secretary **Edwards**. We will be glad to.

[The information follows:]

### Impediments to R&D

The statement from the Fortune Magazine article states that industry is reluctant to perform R&D because it cannot keep the results secret. This is not the whole story. As the article goes on to point out, the possible inability to profit even if secrets are kept, the low payback from many inventions, the possibility that as much profit may accrue from being "second" as "first", and the fact that many companies feel they are not profitable enough to invest in anything but short-range and immediate R&D may provide an even larger deterrent to industrial research.

The magazine article goes on to discuss the possibility that Government/industry partnerships might be formed to undertake much of the long-range research and suggests industrial participation should be a necessary condition for any Government support. This policy has been adopted to a considerable extent by the Department of Energy. Much of the research currently being supported by DOE involves industry contributions or participation. At the same time, a significant portion of our research, primarily the basic research we support, is so long-range in nature and often so risky that industrial participation or support is neither feasible nor likely.

### FOSSIL ENERGY PROJECT TERMINATIONS

Mr. **Murtha**. Let's talk about fossil energy R&D. The proposal for fossil energy for 1983 is approximately $107 million. In order to make the sharp transition from the nearly $450 million budget for fiscal year 1982 to this much reduced budget of fiscal year 1983, you have proposed to terminate a number of projects during fiscal year 1982. Many of these projects were specifically continued by Congress in its deliberations on the fiscal year 1982 appropriation. Under what authority are you terminating these programs during the fiscal year 1982?

Secretary **Edwards**. Of course, we submitted the budget on February 8th and we are in the process of reviewing all of the programs right now and we hope to request a deferral of about $44 or $45 million of fiscal year 1982 authority and we hope to submit that shortly. And with these funds that we get back from the deferral we hope to use those as funds to finance the restructuring of the fossil energy field and headquarters organizations.

If we are going to discontinue these in fiscal year 1983, it makes sense to start the closeout in fiscal year 1982. This deferral request should be over to you shortly and I am sorry it is not over already but OMB has been right busy.

Mr. **Murtha**. What do you estimate the total termination costs are for each of those projects?

Secretary **Edwards**. We can get you a list of those termination costs. It is hard to estimate the termination costs at this stage because we don't know what it is going to cost to terminate the contracts and that sort of thing. It could be difficult to give you even a reasonable estimate of the termination costs on those.

[The information follows:]

*Estimated termination costs for fossil energy R. & D. projects* [1]

| *Terminated project* | *Millions* |
|---|---|
| H-coal pilot plant | [2] 23.9 |
| Exxon donor solvent pilot plant | [3] 2.0 |
| Liquid phase methanol PDU | 1.0 |
| PFB combined cycle pilot plant | [4] |
| PFB alternate turbine testing | 0 |
| Advanced combustion technology | 0 |
| High temperature turbine, phase III | .5 |
| MHD | [5] 11.5 |
| Bi-gas pilot plant | [6] 3.0 |
| Fixed-bed gasifiers | [7] .2 |
| Peat gasification at Hygas plant | [8] .7 |
| Agglomerating fluidized-bed effort | [9] 2.6 |
| Atmospheric entrained-bed slagging gasifier | [10] .6 |
| Tar sands in situ experiment | 0 |
| Underground coal gasification | 0 |

[1] The general assumption is that termination and/or phase-out will be initiated in mid-April, however, this will vary according to agreements reached with the industrial participants. It should be noted that the accuracy of the estimates provided are highly uncertain.

[2] Termination costs include $14,200,000 for dismantling and site restoration.

[3] The DOE share of project closeout cost in disposition of the pilot plant and facilities upon completion of the project as currently agreed upon is $1,000,000. If premature termination of the project should take place prior to the agreed upon completion, DOE could be liable for an additional $5,000,000 unless renegotiated. The current fiscal year 1982 funding level for EDS would not require termination but disposition subsequent to the currently agreed to completion date.

[4] Termination costs are covered by existing contractual obligations. However, the contractor has indicated that they may submit additional claims.

[5] Termination costs include funds for facility shutdown and subsequent mothballing.

[6] Termination costs include $3,000,000 for mothballing of facility. Amounts do not include maintenance and removal of facility and site restoration if required.

[7] Termination costs are for mothballing of gasifiers.

[8] Termination costs include $700,000 for mothballing of facility. Amounts do not include maintenance and removal of facility and site restoration in the event that title transfer of the facility is not possible.

[9] Termination costs include $2,600,000 for mothballing the facility. Amounts do not include maintenance and removal of facility and site restoration in the event that title transfer of the facility is not possible.

[10] Termination costs do not provide for removal of facility and site restoration should contractor not accept transfer of facility within 1 year.

Mr. **Murtha**. What steps have you already taken to implement your plan to terminate a number of fossil R&D projects?

Secretary **Edwards**. We do not plan to do anything until somewhere around the 1st to the 15th of April when we will start activity along this line. We hope by that time to get the deferral over to you and get some action on that.

Mr. **Murtha**. Has some of the work slowed down already in these projects?

Secretary **Edwards**. I might ask Mr. Mares to answer that.

Mr. **Mares**. We are spending at a rate that is consistent with our understanding of the requirements of the fiscal year 1982 appropriation. We have talked to various firms that we would propose to terminate with and would have those discussions before we would initiate any termination actions.

### DEFERRAL OF FISCAL YEAR 1982 FOSSIL ENERGY FUNDS

We do expect, as the Secretary said, that the deferral package will be submitted to Congress very shortly and we do not intend to, in fact, terminate anything before the 15th of April, although we certainly are going to have conversations with the particular firms before that time, looking towards the possibility of termination.

Mr. **Murtha**. When do you expect to get the deferral package to the Congress?

Mr. **Mares**. Our hope is to get it very soon.

Mr. **Murtha**. What would you say, this week?

Secretary **Edwards**. Next Monday is OMB's latest estimate as of this morning.

Mr. **Mares**. And our reason for saying that we will not act to terminate before the 15th of April is, in fact, to allow lead time for deliberation by the Congress on the full package.

As you know, the particular items in that package were made quite clear in the February 8th President's budget although the formal deferral package has not been sent up.

Mr. **Murtha**. What capability do we lose by these determinations?

Mr. **Mares**. Capability in what sense, sir?

Mr. **Murtha**. I might point out that if the deferral is presented on the 15th or 16th of March and termination starts April 15th; that Congress has less than 3 weeks to deal with the deferral when you take Easter recess into account.

April 15th is that the date of the termination?

Mr. **Mares**. Well, as of this moment our position would have been that we would not start anything before the 15th of April. I might say that the deferral package itself is going to say April 1 because at the time the package was put together we expected to initiate termination on April 1 and we did not have an opportunity to change it. So when it comes to you it is going to say April 1, but at least in fossil energy, no termination will start before the 15th of April. This date was predicated on the judgment that it would have allowed 30 days prior notification. You are pointing out something that had not been contemplated and I will reflect on that.

### IMPACT OF PROJECT TERMINATIONS

Mr. **Murtha**. Let me get back to the question about capability. What investments have we made and what do we lose as far as those investments when we terminate these projects?

Mr. **Mares**. The overall judgment in what one might perceive as loss vis-a-vis the gain in terms of our overall fossil program is that it is an appropriate move.

In many cases these are projects where the Nation has gotten a lot of value from its investments. The technology has been tested. The facilities have been used as contemplated. The country has benefited.

In a few other cases they are being terminated before they have been completed. However, the judgment in those cases was that in the context of both the role of the Federal Government in the particular project, vis-a-vis the private sector, and given the potential final costs of the project, that it was appropriate to move to terminate at this time.

### PRIVATE INDUSTRY TAKEOVER OF TERMINATED FOSSIL ENERGY PROJECTS

Mr. **Murtha**. Do you have any industries lined up to take over any of these projects as they are terminated?

Mr. **Mares**. Well, in each case, we are talking with the principals of the particular project. They know what we are intending to do and in some cases they are working with their own groups or others to get additional financing and will be continuing beyond the end of the Federal Government funding. In other cases we do not know what will finally happen.

Mr. **Murtha**. Would you provide the details of any possibility of private enterprise taking over any of these projects for the record?

Mr. **Mares**. That is a moving target, sir, because in the course of any particular series of conversations we learn more information about what is the status of them but I will give it to you as of the particular moment in time.

Secretary **Edwards**. There are some evidences, though, that we can list. There is one project in California in which Westinghouse, Exxon and British Gas are developing advanced gasifiers following developmental work here at DOE. Shell and Texaco are sponsoring advanced synthetic fuels technology developed outside the Federal Government. Another example is in pressurized fluidized beds where some of this work had been done by DOE in conjunction with the private sector.

In that type of thing there is evidence that industry will be picking them up.

Mr. **Mares**. In the case of the H-Coal pilot plant, we do expect the parties concerned to continue to operate the H-Coal facility rather than dismantling it which was called for under the contract. We have a similar situation with the Exxon Donor Solvent project. It is a little too soon to tell the final disposition of the liquid phase methanol PDU and whether they will be able to get additional funding to continue in the private sector.

On PFB, combined cycle plant, we have a meeting this afternoon with a group of people on the issue of trying to determine whether the private sector will participate to a greater extent like they have been doing generally in other projects.

In the High Temperature Turbine Technology, Phase 3 activity, I think there is at least some indication that there will be a next step financed by the private sector, slightly different than what we might have done but that is appropriate.

We don't know for sure how the Westinghouse PDU is going to work out. Obviously, they had some successes in trying to solicit interest in their program. It is too early to tell on that.

So, I would say that there have been numerous cases, on projects that have been funded by the Government, that the private sector has stepped up and participated fully. There are some instances where it has not. Where it has not we are pushing as hard as we can to make sure that they do.

Mr. MURTHA. If you would give us the details on the other projects that you anticipate termination it would be helpful to us in view of the fact that we have such a short time to consider these.

[The information follows:]

### PRIVATE SECTOR INTEREST IN FOSSIL ENERGY R. & D. PROJECTS.

The question that you raised regarding the private sectors intentions to carry out further R&D activities in the project areas proposed for termination in fiscal year 1982 is extremely difficult to answer with any degree of precision. While the Department has had discussions with a number of representatives of the private sector, both at the senior management level and the technical level, we do not have positive assurances that they will in actuality pick up these projects subsequent to their termination. We have received expressions of interest, however, that make us hopeful that a significant number of projects will, in fact, be continued by the private sector. In point of fact, we will not know which projects will be continued until DOE has withdrawn and permitted the private sector to make independent economic decisions. I would make the case that this is entirely appropriate. The private sector should make the determination as to the technologies that are to be developed further and subsequently commercialized. The market place should play the deciding role in this area, not government. The following presents the information that we currently possess with regard to future private sector involvement in Fossil Energy R&D projects.

### TERMINATED PROJECT AND PROPOSED PLANS BY PRIVATE SECTOR FOR TAKEOVER

H-Coal Pilot Plant—Negotiations are currently underway and are progressing with Ashland Synthetic Fuels, Inc. (ASFI) regarding the continued operation of the pilot plant. Although negotiations are being conducted with ASFI, the potential outcome is still uncertain.

Exxon Donor Solvent Pilot Plant—DOE has negotiated with private sector participants to redistribute royalty rights to permit the completion of the planned test program. This rescoping will permit an orderly phase out of the project and reserve government funds to pay for dismantlement of the facility.

Liquid Phase Methanol PDU—DOE, at this time, is not actively negotiating with private interests to continue this activity, since there are no indications that the private sector will, in the near term, carry out the proof-of-concept work.

PFB Combined Cycle Pilot Plant—DOE is presently attempting to renegotiate an agreement with Curtiss-Wright to increase their share of the cost and to cap government funding.

PFB Alternative Turbine Testing—This program will not be initiated pending outcome of renegotiations with Curtiss-Wright regarding private sector involvement with PFB combined cycle pilot plant.

Advanced Combustion Technology—DOE does not have, at this time, indications that R&D activities conducted in this area will be picked up by the private sector.

High Temperature Turbine, Phase III—Phase III of the HTTT development activity is not being initiated. A logical conclusion was reached at the completion of Phase II. Future private sector involvement is expected in this area. Discussions have been held that suggest that Phase III activity will be conducted although a different technical approach will be utilized.

MHD—DOE does not have, at this time, positive indication from the private sector that they are prepared to undertake the expense of continuing MHD development activity. The facilities will be disposed of in accordance with standard government procedures for handling surplus property and equipment. Industry, the academic community and other government agencies will have the opportunity to acquire the facilities and equipment.

Bi-Gas Pilot Plant—At present, interest in continued operation of the Bi-Gas facility has been limited to general discussions with Koppers Babcock Wilcox Corporation (KBW). The very preliminary proposal involves two options which range from $11 to $28 million. It is our understanding that a significant portion of these costs would have to be borne by the government.

Fixed-Bed Gasifier—At the present time, DOE does not have indications or expressions of interest from the private sector regarding the potential for future additional R&D activity by the private sector in this area.

Peat Gasification at HYGAS Plant—The Institute of Gas Technology (IGT) has indicated an interest in this facility. Discussions with IGT will continue with a view towards transferring the title of the facility and continued R&D operations if mutual interest can occur.

Agglomerating Fluidized-Bed Effort—Transfer of the facility to the contractor, Westinghouse, under appropriate terms and conditions is being considered. Should this transfer not take place, "mothballing" or dismantlement of the facility will occur.

Atmospheric Entrained-Bed Slagging Gasifier—This project has reached its planned expiration date and is being closed out rather than terminated prematurely. All project objectives attainable with the existing equipment have been met and the design is developed to a point where private industry can complete any design refinements and scale-up activities.

Tar Sands In Situ Experiment—Although no discussions with the private sector have been conducted to date with a view towards their undertaking R&D activities in this area, possible SFC involvement, leasing of federal lands with tar sands deposits, and advances in thermal stimulation technology all point to potential private sector involvement in field projects of this nature.

Underground Coal Gasification—Technology development in underground coal gasification has reached the stage of development where the private sector can proceed with additional development necessary for resource utilization. Specifically, the successful proof of concept for steeply dipping coalbeds has diminished the need for further Federal support. Several major energy companies—Exxon and ARCO, to name two—have acquired government data and test results.

## MHD TERMINATION

Mr. MURTHA. Can you tell us about the MHD termination?

Mr. MARES. The situation there is that we would plan to start the termination of MHD on the 15th of April looking towards wrapping up that technology in a fashion that would provide the Nation a basis from which to proceed at such time where it was decided to proceed.

The next logical step would be a $500 million engineering test facility. In the context of all the technologies that we are trying to support or provide a technology base for, and there are other technologies which provide electricity in more efficient and environmentally accepted fashions, we find it hard to justify that particular investment at this time. But we are trying to wrap it up in a fashion that would be a sensible starting point if the work resumed at another time.

Mr. MURTHA. Is there any other country in the world who is ahead of us in MHD research?

Mr. MARES. There are several countries that have done work on that. The Soviets have operated an MHD facility based on natural gas. We are striving to use gasified coal for the fuel for ours and the Soviets apparently are planning to build a larger scale MHD facility than we were contemplating for the next stage.

Mr. **Murtha**. Are budget constraints the primary reason that MHD has been cut back? I had a great concern about this program for probably 3, 4, or 5 years, but then all at once, I realize that this did seem like a possibility and a good investment for the Government. Are budget constraints the main reason that we are cutting back on MHD?

Mr. **Mares**. I think that is a factor. It is not the only factor. I think that when you look at MHD in comparison to others in comparable stages of development and take into account MHD's particular role in overall energy development and where it stands today, we have not solved all the problems in MHD.

Mr. **Murtha**. So some funding would be certainly worthwhile?

Mr. **Mares**. No, sir. I will not support any added funding on that program. I don't think that would be appropriate.

Mr. **Murtha**. Well, it may not be appropriate from a priority process but are you saying there are areas that could stand additional research?

Mr. **Mares**. Well, I think that is probably true in every technology. There are some areas which have not been totally explored.

Mr. **Murtha**. Well, it is clear in some technologies, but I always had the impression that it was a long way off in MHD.

Mr. **Mares**. Yes, it is.

Mr. **Murtha**. If you stop research at this early stage, it seems like it would substantially reduce the chance of the possibility of long-range development of MHD unless the private sector takes over.

Mr. **Mares**. One never knows for sure whether the private sector will take it over and select it until we stop. This is one of the most difficult choices that we have and have always had. What in fact, will they do. There are people that come into our office and say don't stop funding or we won't continue but then I would have to say that in the last 12 months that many times when we pulled back, they, in fact, have gone ahead and worked on the critical aspects of the technology.

So I would say the fossil energy industry is really a very vibrant industry. It is selecting things that are really important and is going to be making major contributions in research and development in that area.

### BI-GAS

Mr. **Murtha**. How about Bi-Gas?

Mr. **Mares**. Bi-Gas, we are proposing to terminate. We believe we have gotten technology value from it. It was designed as a Hi-Btu gas plant. We, the Nation, have developed several such plants to the demonstration stage and some are already being commercialized.

Our view is that although there has been a study about the possibility of using it for other types of research, it is too large in scale relative to the level of research activity we are doing generally.

We believe that it could well be used by a firm that was desirous of building a commercial scale plant, not necessarily of that process but of a different process because the front end and the back end of the plant are there.

Our recommendation would be that the facility be mothballed, not taken down, until such time as there is, a firm or group of firms which have a process that they want to test at that scale.

You know better than I that the Bi-Gas facility is a very large-scale plant. It's capacity is over 100 tons a day and we just don't think it is appropriate for us to be funding, on a continuing basis, that kind of facility to have for generic research in those coal processing areas.

Mr. MURTHA. How many other similar facilities do we have throughout the country? Are there any other test facilities throughout the country that are at that scale?

Mr. MARES. At the 100-ton scale?

Mr. MURTHA. Yes.

Mr. MARES. Well, we have EDS and H-Coal which are 250 tons per day. Wilsonville is 10 to 14. Both of those facilities are owned by the Government.

### TRANSFER OF FOSSIL FACILITIES

We are going to transfer the facilities over to the private sector so that instead of spending Government money to dismantle there is a facility that can be used by the private sector.

Mr. MURTHA. How do you do that? Do you turn it over to the community, or do you try to find an industry that will buy it, or do you sell it to them for a reasonable price to eliminate the mothballing and the operation costs?

Mr. MARES. It is more nearly the latter. There is generally a contract at the start of the project which provides that at the end of the project—it can provide almost anything—but one way is that the Government is obligated to remove the facility and clear the site where the site is owned by the private sector. In that case, what we have tried to do is negotiate with the private party with whom we have been operating a plant to have them assume the responsibility for the facility and eliminate our obligation to level the site. And we have been, in several cases, prepared to have at least the portion of that termination reserve spent for operating purposes by the private party instead of being rescinded and taken back. But in almost every case it is slightly different. We have a substantial number of pilot plants of varying sizes around the country that we are trying to get away from because when they are not operating they cost the Federal Government money.

We have tried in each case, in our program, to look to see if there was an existing facility that we could use instead of trying to build something new.

Mr. MURTHA. Have you tested eastern coals in the Bi-Gas process at this point?

Mr. MARES. I do not know the answer to that question. I will have to get it for you.

Mr. MURTHA. Submit that for the record.

[The information follows:]

### BI-GAS PROCESS

To date, there have been two types of coal tested at the Bi-Gas pilot plant; Montana Rosebud which is a Western Sub-bituminous coal and Pittsburgh No. 8 which is an Eastern bituminous coal. The Montana Rosebud has been extensively tested in approximately 70 tests totaling 2,078 hours of operation. The longest test run was 172 consecutive hours which was completed in April 1981. Although the test had varying degrees of success, four tests were very successful. Successful test runs are characterized by a sustained run period, "smooth" operation, good material balance, and a planned shutdown.

Testing of Pittsburgh No. 8 coal was recently initiated with two "shakedown" tests totaling 10 hours during February and March of 1982.

Mr. MURTHA. So we will have it in the record, would you submit what you requested for fossil energy research to OMB?

Secretary EDWARDS. We will be happy to do that.

[The information follows:]

## DEPARTMENT OF ENERGY
## FY 1982/1983 BUDGET REVISIONS
## SUMMARY OF FULL-TIME EQUIVALENTS INCLUDED IN DECISION UNITS

### Other Than Full-Time Permanent

Organization: Fossil Energy

| | FY 1981 Positions | FY 1982 FTE | FY 1983 FTE |
|---|---|---|---|
| **Coal** | | | |
| Headquarters | 5.0 | 5.0 | 5.0 |
| Field | 75.0 | 55.5 | 55.5 |
| Subtotal | 80.0 | 60.5 | 60.5 |
| **Petroleum** | | | |
| Headquarters | - | 2.0 | 2.0 |
| Field | 37.0 | 33.5 | 33.5 |
| Subtotal | 37.0 | 35.5 | 35.5 |
| **Gas** | | | |
| Headquarters | - | - | - |
| Field | 8.0 | 3.0 | 3.0 |
| Subtotal | 8.0 | 3.0 | 3.0 |
| **Resource Applications** | | | |
| Headquarters | 9.0 | - | - |
| Field | - | - | - |
| Subtotal | 9.0 | - | - |
| **Fossil Energy** | | | |
| Headquarters | 14.0 | 7.0 | 7.0 |
| Field | 120.0 | 92.0 | 92.0 |
| Total | 134.0 | 99.0 | 99.0 |

## DEPARTMENT OF ENERGY
## FY 1982/1983 BUDGET REVISIONS
## SUMMARY OF FULL-TIME EQUIVALENTS INCLUDED IN DECISION UNITS

### Full-Time Permanent

**Organization:** Fossil Energy

| | FY 1981 Positions | FY 1982 FTE | FY 1983 FTE |
|---|---|---|---|
| **Coal** | | | |
| Headquarters | 206 | 209 | 200 |
| Field | 674 | 539 | 518 |
| Subtotal | 880 | 748 | 718 |
| **Petroleum** | | | |
| Headquarters | 18 | 32 | 32 |
| Field | 241 | 208 | 200 |
| Subtotal | 259 | 240 | 232 |
| **Gas** | | | |
| Headquarters | 8 | 13 | 13 |
| Field | 32 | 29 | 27 |
| Subtotal | 40 | 42 | 40 |
| **Resource Applications** | | | |
| Headquarters | 124 | - | - |
| Field | - | - | - |
| Subtotal | 124 | - | - |
| **Fossil Energy** | | | |
| Headquarters | 356 | 254 | 245 |
| Field | 947 | 776 | 745 |
| Total | 1303 | 1030 | 990 |

# DEPARTMENT OF ENERGY
# CONTROL TECHNOLOGY & COAL PREPARATION

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- In the combined flue gas cleanup subactivity, continue development efforts for combined $NO_x$, $SO_x$, and particulate removal. ($3.4M)
- Continue R&D to determine contaminant effects on fuel cell performance. ($1.1M)
- Continue development and testing of advanced hot gas cleanup concepts for PFB applications. ($7.6M)
- Continue "cross-cutting" technology development in waste management, instrumentation, and process controls. ($5.5M)
- Continue long range technology development for coal prep and analysis. ($3.0M)
- Capital Equipment. ($0.8M)

Changes from the March request:

- Eliminate R&D technology development in the area of long term, advanced, combined flue gas cleanup, associated technology base studies and particulate characterization and control development. ($-3.1M)
- Reduce efforts in the fuel cell cleanup systems area until FY 1983. ($-1.7M)
- Eliminate the Limestone Injected Multi-Stage Burner (LIMB) program. ($-4.0M)
- Reduce coal prep. and analysis activities in the area of coal-washability testing and characterization, basic process evaluation, and operation of the Ames test facility. ($-3.0M)

## DEPARTMENT OF ENERGY
## CONTROL TECHNOLOGY & COAL PREPARATION

## FY 1983 NARRATIVE JUSTIFICATION

**FY 1983 Request:**

**Activities Funded:**

- o Flue Gas Cleanup ($7.6M)
  - Advanced combined $NO_x/SO_x$/particulate cleanup with emphasis on continuation of the electron irradiation and advanced chemical process technology development.
- o Gas Stream Cleanup ($12.0M)
  - Complete process development unit scale tests and evaluations of advanced particulate removal concepts in the area of turbine cleanup systems. ($7.8M)
  - Complete process modification technology evaluations for pollutant control. Evaluate sorbents for alkali, trace metal, and organic compound capture. ($1.3M)
  - Continue fuel cell hot gas stream cleanup technology development. ($2.9M)
- o Cleanup Base Technology ($1.7M)
  - Continue technology development in specific waste management projects such as high temperature chlorination for minerals recovery or, development of light weight cellular concrete. Complete waste sampling and characterization effort.
- o Coal Preparation and Analysis ($6.5M)
  - Continue technology development on coal washibility to include correlating and characterizing regional coal. ($2.9M)
  - Continue advanced cleaning technology development to include physical/chemical sulfur and ash removal process development. ($2.3M)
  - Study fine coal processing techniques to include grinding and dewatering process development. ($1.3M)
- o Capital Equipment ($1.2M)

**Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:**

- o None

### DEPARTMENT OF ENERGY
### FY 1982/1983 REVISED BUDGET

### CONTROL TECHNOLOGY AND COAL PREPARATION
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Coal preparation and analysis: | | | | | | | | |
| Operating expenses ........................... | 6,000 | 6,967 | -3,000 | -1,500 | 3,000 | 5,467 | 6,500 | 6,524 |
| Subtotal ............................... | 6,000 | 6,967 | -3,000 | -1,500 | 3,000 | 5,467 | 6,500 | 6,524 |
| Flue gas cleanup: | | | | | | | | |
| Combined flue gas cleanup | | | | | | | | |
| Operating expenses ........................... | 6,500 | 16,092 | -3,100 | -902 | 3,400 | 15,190 | 7,600 | 4,366 |
| Subtotal ............................... | 6,500 | 16,092 | -3,100 | -902 | 3,400 | 15,190 | 7,600 | 4,366 |
| Gas stream cleanup: | | | | | | | | |
| Turbine cleanup systems | | | | | | | | |
| Operating expenses ........................... | 7,600 | 5,334 | ... | ... | 7,600 | 5,334 | 7,800 | 8,609 |
| Fuel cell cleanup systems | | | | | | | | |
| Operating expenses ........................... | 2,800 | 2,596 | -1,700 | -765 | 1,100 | 1,831 | 2,900 | 2,078 |
| Process modification technology | | | | | | | | |
| Operating expenses ........................... | 4,000 | 2,659 | -4,000 | -2,493 | ... | 166 | 1,300 | 585 |
| Subtotal ............................... | 14,400 | 10,589 | -5,700 | -3,258 | 8,700 | 7,331 | 12,000 | 11,272 |
| Cleanup base technology: | | | | | | | | |
| Operating expenses ........................... | 5,500 | 5,649 | ... | ... | 5,500 | 5,649 | 1,700 | 4,336 |
| Subtotal ............................... | 5,500 | 5,649 | ... | ... | 5,500 | 5,649 | 1,700 | 4,336 |
| Total | | | | | | | | |
| Operating expenses ............................. | 32,400 | 39,297 | -11,800 | -5,660 | 20,600 | 33,637 | 27,800 | 26,498 |
| Capital equipment .............................. | 800 | 1,127 | ... | ... | 800 | 1,127 | 1,200 | 1,743 |
| Control technology and coal preparation ... | 33,200 | 40,424 | -11,800 | -5,660 | 21,400 | 34,764 | 29,000 | 28,241 |

# DEPARTMENT OF ENERGY
# FY 1982/1983 REVISED BUDGET

## ADVANCED RESEARCH AND TECHNOLOGY DEVELOPMENT
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Processes:** | | | | | | | | |
| Operating expenses | 21,400 | 23,540 | -2,000 | -500 | 19,400 | 23,040 | 18,700 | 19,409 |
| Subtotal | 21,400 | 23,540 | -2,000 | -500 | 19,400 | 23,040 | 18,700 | 19,409 |
| **Direct utilization:** | | | | | | | | |
| Operating expenses | 12,800 | 10,846 | -2,200 | -1,130 | 10,600 | 9,716 | 9,232 | 8,747 |
| Subtotal | 12,800 | 10,846 | -2,200 | -1,130 | 10,600 | 9,716 | 9,232 | 8,747 |
| **Materials and components:** | | | | | | | | |
| Materials | | | | | | | | |
| Operating expenses | 9,000 | 8,135 | -1,000 | -500 | 8,000 | 7,635 | 8,280 | 7,215 |
| Components | | | | | | | | |
| Operating expenses | 3,000 | 3,042 | -1,000 | -500 | 2,000 | 2,542 | 2,790 | 2,914 |
| Subtotal | 12,000 | 11,177 | -2,000 | -1,000 | 10,000 | 10,177 | 11,070 | 10,129 |
| **Program development and coordination:** | | | | | | | | |
| Budget and administration | | | | | | | | |
| Operating expenses | 600 | 786 | ... | ... | 600 | 786 | ... | ... |
| Construction | 7,000 | 7,553 | -3,000 | -1,000 | 4,000 | 6,553 | 6,350 | 3,850 |
| Engineering analysis | | | | | | | | |
| Operating expenses | 1,600 | 1,713 | ... | ... | 1,600 | 1,713 | ... | 338 |
| Environmental activities | | | | | | | | |
| Operating expenses | 3,000 | 3,160 | ... | ... | 3,000 | 3,160 | 2,100 | 2,619 |
| Planning and policy | | | | | | | | |
| Operating expenses | ... | 1,347 | ... | ... | ... | 1,347 | 1,177 | 1,431 |
| Technology base synthesis | | | | | | | | |
| Operating expenses | 1,100 | 660 | ... | ... | 1,100 | 660 | 990 | 858 |
| Instrumentation, control, and diagnostics | | | | | | | | |
| Operating expenses | 2,200 | 1,320 | ... | ... | 2,200 | 1,320 | 2,290 | 1,902 |
| Subtotal | 15,500 | 16,539 | -3,000 | -1,000 | 12,500 | 15,539 | 12,907 | 10,998 |
| **University coal research:** | | | | | | | | |
| Operating expenses | 5,400 | 5,388 | ... | ... | 5,400 | 5,388 | 5,500 | 5,496 |
| Subtotal | 5,400 | 5,388 | ... | ... | 5,400 | 5,388 | 5,500 | 5,496 |
| **Total** | | | | | | | | |
| Operating expenses | 60,100 | 59,937 | -6,200 | -2,630 | 53,900 | 57,307 | 51,059 | 50,929 |
| Capital equipment | 500 | 550 | ... | ... | 500 | 550 | 598 | 974 |
| Construction | 7,000 | 7,553 | -3,000 | -1,000 | 4,000 | 6,553 | 6,350 | 3,850 |
| Adv. research and technology development | 67,600 | 68,040 | -9,200 | -3,630 | 58,400 | 64,410 | 58,007 | 55,753 |

DEPARTMENT OF ENERGY
ADVANCED RESEARCH & TECHNOLOGY DEVELOPMENT

FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Continue processes research efforts toward the fundamental understanding of coal liquefaction. ($10.7M)
- Expand development of novel gasification concepts/chemistry processes. ($8.7M)
- Refine the modeling procedures and expand the data base for development of advanced approaches to coal utilization in industrial systems. ($10.6M)
- Understand materials degradation and develop innovative components for fossil energy applications. ($10.0M)
- Initiate an instrumentation research program and select high risk projects. ($3.3M)
- Provide environmental analysis of Fossil Projects. ($3.0M)
- Provide planning, budgeting, and administrative support. ($2.2M)
- Continue University Coal Research Program. ($5.4M)
- Construction at the Energy Technology Centers. ($4.0M)
- Capital equipment ($0.5M)

Changes from the March request:

- Reduce technology development in the area of processes research. ($-2.0M)
- Delay development in the area of high temperature ceramic heat exchangers and reduce the scope of synfuel combustion technology research. ($-2.2M)
- Reduce materials research and exploratory components development. ($-2.0M)
- Reduce General Plant Projects at the ETC's by 50%. ($-3.0M)

## DEPARTMENT OF ENERGY
## ADVANCED RESEARCH AND TECHNOLOGY DEVELOPMENT

### FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Direct utilization - Focuses on expansion of data base on fundamental subprocesses of injection, pyrolysis, devolatization, flame stability, and pollutant formation in direct coal combustion. ($9.2M)
- Materials and components ($11.1M) - Focus on the following:
  - Slag/refractory interaction
  - Structural ceramics
  - Thermo-mechanical design
  - Hi-temperature corrosion
  - Organic fluid corrosion
  - Fluid models/slurry letdown devices/novel concepts
- Processes ($18.7M) - Work will be conducted in the following:
  - Novel gasification concepts/chemistry/processes
  - Entrained and fluid bed gasifiers
  - Catalytic gasification/pyrolysis
  - Novel acid gas and sulfur removal/gas separation/particle removal
  - Structure and characteristics of coal and coal-derived liquids/analytic research
  - Coal liquefaction mechanisms/catalysis and kinetics
  - Coal-derived liquids upgrading
  - Exploratory liquefaction development
  - Indirect liquefaction
- Program Development and Coordination ($12.9M)
  - Environmental system engineering/safety/health studies
  - Overview of FE programs to assure project compliance with Federal regulations on environment
  - Provide seed funding for select high risk research projects/standard reference coal bank/research policy guide.
  - Instrumentation research/sensor development/measurement concept investigations/scientific feasibility studies.
  - PETC (82-F-506) facility
  - METC waste water (83-F-501) facility
  - Planning and policy
  - GPP

- University Coal Research ($5.5M)
  - Competitive grants for university projects on fundamentals of coal science, characterization, conversion, combustion, and environmental science
- Capital Equipment ($0.6M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- Program Development and Coordination/Engineering Analysis
  - Continuation of efforts in critical systems engineering analysis to support Fossil Energy programs. Efforts include development of process engineering models, economic baseline data and various cost analyses. ($1.6M)
- Program Development and Coordination/Budget and Administration
  - Development of specialized reports involving use of support services contracts. ($0.6M)

## DEPARTMENT OF ENERGY
## COAL LIQUEFACTION

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Provide for orderly phase out of DOE participation in the Donor Solvent pilot plant program. ($15.0M)
- Complete construction of M-Gas pilot plant and continue other selected indirect liquefaction efforts. ($12.0M)
- Development of high activity disposable catalysts and improved H-Coal catalyst. Continue pyrolysis process development R&D. Continue technology base research programs. ($15.8M)
- Continue engineering evaluations and limited health effects studies. ($8.6M)
- Provide DOE share of Wilsonville PDU operation and other activities necessary to establish proof of concept of improved direct liquefaction processes. ($12.3M)
- Capital Equipment. ($0.7M)

Changes from the March request:

- Eliminate funding for the H-Coal pilot plant program and initiate earlier phase out of DOE involvement. ($-20.0M)
- Reduce funding for the EDS pilot plant program and renegotiate a phase out plan with project sponsors. ($-15.0M)
- Curtail the catalyst and bench scale process tests in the area of Indirect Liquefaction. ($-2.0M)
- Reduce disposable catalyst research ($-2.0M); and pyrolysis process development. ($-0.5M)
- Curtail environmental studies and other support. ($-2.0M)

## DEPARTMENT OF ENERGY
## COAL LIQUEFACTION

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Indirect Liquefaction ($14.4M)
  - Operate the 100 BPD methanol-to-gasoline fluid bed pilot plant under joint program with FRG in Germany to provide data adequate to commercialize this improved process and to allow other reactions in a fluid bed catalystic system.
  - Operate the liquid phase liquefaction PDU (at LaPorte, Texas) in the methanol mode to prove the merit of this advanced syngas to liquid process system; this system, which is the proof-of-concept unit will be used later for other indirect liquefaction reactions for a wider range of fuel products.
  - Bench scale process studies and catalyst evaluations for slurry phase indirect liquefaction reactions; this smaller scale work feeds the liquid phase PDU future work.
- Advanced Process Development ($27.8M)
  - Bench scale and lab process studies on slurry phase (disposable) catlysts for improved direct liquefaction of coal. This work will feed proof-of-concept work at the PDU scale.
  - Operate the Wilsonville 6TPD integrated PDU for proof-of-concept of various improved direct liquefaction processes. This facility, which contains coal dissolution, solvent deashing, and extract hydrogeneration units capable of flexible integration, is the capstone of the advanced direct liquefaction program.
  - Bench scale studies of integrated two-stage liquefaction, a process configuration capable of providing increased yield of liquids of improved quality with a better management of hydrogen utilization.
  - Bench scale and lab studies of improved direct catalytic liquefaction using high activity/high selectivity synthetic catalysts.
  - Engineering development studies in key processing steps (such as slurry preheating, deashing, and solvent quality control) to enhance the data base for improved processes in coal hydrogeneration processes.
- Support Studies/Engineering Evaluations ($8.6M)
  - Instrument and component R&D to identify and exploit promising means of improving critical equipment for coal liquefaction process. Process development work at pilot scale has illustrated significant problem areas in which improvements are essential if advanced processes are to be implemented.

- Studies to identify and develop proces modifications which will mitigate the toxic effects which have been identified for coal liquids. This work will provide the most constructive and integrated means of reducing the potential health impact of producing and using coal liquids.
- Engineering studies and evaluations to provide research guidance and qualititative measures of potential and accomplishments in coal liquefaction process development.
- Project management services and administrative support for liquefaction program execution.

o Capital Equipment ($0.8M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

o Advanced Process Development

- Completion of advanced process development projects featuring two processes involving short reaction time hydropyrolysis of coal and research on flash hydropyrolysis at atmospheric pressure. ($4.9M)

# DEPARTMENT OF ENERGY
# COMBUSTION SYSTEMS

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Complete operation and data collection of the industrial boiler demonstration at Georgetown University, Great Lakes Naval Training Station, and Shamoki and continue AFB technology activities. ($7.2M)
- Phase out construction of the combined cycle pilot plant. ($8.9M)
- Support activities for PFB base technologies. ($0.7M)
- Continue the prototype investigation of coal-water mixtures and develop technology in other coal based fuels. ($4.4M)
- Evaluate advanced combustor concepts for direct combustion of coal in existing and new oil designed utility and industrial boilers. ($1.1M)

Changes from the March request:

- Delay initiation of conceptual design studies to explore advanced fluidized bed concepts which could have higher combustion efficiency and better sorbent utilization. ($-4.1M)
- Begin termination of the PFB combined cycle pilot plant ($-6.4M)
- Terminate efforts for the detailed design and procurement of turbine machinery for testing a U.S. type industrial gas turbine. ($-1.0M)
- Reduce efforts in the area of coal-water mixtures and other coal based fuels technology development. ($-2.0M)
- Decrease funding for the investigation of advanced combustor concepts. ($-3.0M)

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

COAL LIQUEFACTION
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Direct hydrogenation:** | | | | | | | | |
| Ebullated-bed (H-Coal) pilot plant | | | | | | | | |
| Operating expenses | 20,000 | 41,600 | -20,000 | -8,734 | ... | 32,866 | ... | ... |
| Subtotal | 20,000 | 41,600 | -20,000 | -8,734 | ... | 32,866 | ... | ... |
| **Solvent extraction:** | | | | | | | | |
| Exxon donor solvent (EDS) pilot plant | | | | | | | | |
| Operating expenses | 30,000 | 30,480 | -15,000 | -15,000 | 15,000 | 15,480 | ... | ... |
| Subtotal | 30,000 | 30,480 | -15,000 | -15,000 | 15,000 | 15,480 | ... | ... |
| **Indirect liquefaction:** | | | | | | | | |
| Operating expenses | 14,000 | 14,000 | -2,000 | -4,914 | 12,000 | 9,086 | 14,400 | 12,772 |
| Subtotal | 14,000 | 14,000 | -2,000 | -4,914 | 12,000 | 9,086 | 14,400 | 12,772 |
| **Advanced process development:** | | | | | | | | |
| Disposable catalyst hydrogenation | | | | | | | | |
| Operating expenses | 7,000 | 6,988 | -2,000 | -1,894 | 5,000 | 5,094 | 7,200 | 3,500 |
| Pyrolysis and hydropyrolysis | | | | | | | | |
| Operating expenses | 5,400 | 5,433 | -500 | -417 | 4,900 | 5,016 | ... | ... |
| Process research/technology development | | | | | | | | |
| Operating expenses | 18,200 | 30,443 | ... | ... | 18,200 | 30,443 | 20,600 | 20,119 |
| Subtotal | 30,600 | 42,864 | -2,500 | -2,311 | 28,100 | 40,553 | 27,800 | 23,619 |
| **Support studies/engineering evaluations:** | | | | | | | | |
| Environmental studies and other support | | | | | | | | |
| Operating expenses | 10,600 | 10,726 | -2,000 | -1,000 | 8,600 | 9,726 | 8,600 | 9,815 |
| Subtotal | 10,600 | 10,726 | -2,000 | -1,000 | 8,600 | 9,726 | 8,600 | 9,815 |
| **Liquefaction demonstration plants:** | | | | | | | | |
| SRC-I demo plant | | | | | | | | |
| Operating expenses | ... | 3,690 | ... | ... | ... | 3,690 | ... | ... |
| Construction | ... | 100,737 | ... | -65,000 | ... | 35,737 | ... | ... |
| SRC-II demo plant | | | | | | | | |
| Construction | ... | 20,229 | ... | ... | ... | 20,229 | ... | ... |
| Subtotal | ... | 124,656 | ... | -65,000 | ... | 59,656 | ... | ... |
| **Total** | | | | | | | | |
| Operating expenses | 105,200 | 143,360 | -41,500 | -31,959 | 63,700 | 111,401 | 50,800 | 46,206 |
| Capital equipment | 700 | 704 | ... | ... | 700 | 704 | 800 | 836 |
| Construction | ... | 120,966 | ... | -65,000 | ... | 55,966 | ... | ... |
| Coal liquefaction | 105,900 | 265,030 | -41,500 | -96,959 | 64,400 | 168,071 | 51,600 | 47,042 |

**DEPARTMENT OF ENERGY**
**FY 1982/1983 REVISED BUDGET**

**COMBUSTION SYSTEMS**
**(dollars in thousands)**

|  | FY 1982 Request |  | Change |  | Revised FY 1982 Budget |  | Revised FY 1983 Request |  |
|---|---|---|---|---|---|---|---|---|
|  | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Atmospheric fluidized bed combustion:** |  |  |  |  |  |  |  |  |
| **AFB technology development** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 7,200 | 8,613 | ... | ... | 7,200 | 8,613 | 1,100 | 9,322 |
| **AFB advanced concepts** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 4,100 | 1,400 | -4,100 | -1,400 | ... | ... | 3,680 | 981 |
| **Subtotal** | 11,300 | 10,013 | -4,100 | -1,400 | 7,200 | 8,613 | 4,780 | 10,303 |
| **Pressurized fluidized bed combustion:** |  |  |  |  |  |  |  |  |
| **PFB combined cycle pilot plant** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 4,300 | 10,087 | ... | -2,880 | 4,300 | 7,207 | ... | 12,666 |
| **Construction** | 11,000 | 4,500 | -6,399 | -3,484 | 4,601 | 1,016 | ... | 3,585 |
| **PFB support/IEA** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 700 | 2,095 | ... | ... | 700 | 2,095 | 9,125 | 6,742 |
| **PFB alternate turbine testing** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 1,000 | 716 | -1,000 | -716 | ... | ... | ... | ... |
| **Subtotal** | 17,000 | 17,398 | -7,399 | -7,080 | 9,601 | 10,318 | 9,125 | 22,993 |
| **Advanced combustion technology:** |  |  |  |  |  |  |  |  |
| **Coal combustion support and engineering evaluations** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 4,100 | 3,556 | -3,000 | -1,000 | 1,100 | 2,556 | 3,780 | 2,833 |
| **Subtotal** | 4,100 | 3,556 | -3,000 | -1,000 | 1,100 | 2,556 | 3,780 | 2,833 |
| **Alternative fuel utilization:** |  |  |  |  |  |  |  |  |
| **Coal-oil mixutres** |  |  |  |  |  |  |  |  |
| **Operating expenses** | ... | 4,530 | ... | ... | ... | 4,530 | ... | ... |
| **Alternate fuel mixtures** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 6,400 | 4,048 | -2,000 | -1,500 | 4,400 | 2,548 | 5,940 | 4,745 |
| **Subtotal** | 6,400 | 8,578 | -2,000 | -1,500 | 4,400 | 7,078 | 5,940 | 4,745 |
| **Total** |  |  |  |  |  |  |  |  |
| **Operating expenses** | 27,800 | 35,045 | -10,100 | -7,496 | 17,700 | 27,549 | 23,625 | 37,289 |
| **Capital equipment** | ... | 196 | ... | ... | ... | 196 | 270 | 149 |
| **Construction** | 11,000 | 4,500 | -6,399 | -3,484 | 4,601 | 1,016 | ... | 3,585 |
| **Combustion systems** | 38,800 | 39,741 | -16,499 | -10,980 | 22,301 | 28,761 | 23,895 | 41,023 |

## DEPARTMENT OF ENERGY
## COMBUSTION SYSTEMS

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- AFB Technology Base (Lignite) - Investigation of atmospheric fluidized-bed combustion of lignite. ($1.1M)
- AFB Advanced Concepts - This program provides for conceptual design and operation of apparatus relating to advanced concepts which potentially have higher combustion efficiency and better sorbent utilization than can be obtained by conventional FBC. ($3.7M)
- IEA Grimethorpe - IEA is being jointly funded by the United States, Germany and United Kingdom. Without the $6.0M, the U.S. would be unable to meet its international commitments. Should the remaining two nations proceed in FY 1983, the U.S. could be refused data obtained from the test program. ($6.0M)
- PFB Technology Base - PFB has been identified as a long-range/high-payoff/high-risk technology. A well balanced technology data base is needed by the private sector to proceed with commercialization. Technology problem areas which are being addressed include gas turbine materials life at the Long-Term Materials Test Facility, PFB combustion chemistry at the NYU test unit, and a basic support project at CURL to study load following, system control and system instrumentation. ($3.1M)
- Advanced Combustion Technology - The advanced combustion technology (ACT) program will continue its R&D mission of developing advanced coal-fired combustion systems capable of technically, environmentally, and economically viable retrofit to oil designed boilers, furnaces and process heaters. The ACT program is complimentary to the CWM program in that it addresses the technical void that exists in the retrofit conversion of existing pure gas and tightly designed oil combustion systems to coal firing. ($3.8M)
- Alternate Fuels Utilization - This program will concentrate its efforts in the area of coal-water mixtures research and development with the continued objective of generating the necessary "data base" for establishing the technical and economic viability of CWM's as a primary replacement fuel for oil and gas in existing and new boilers/furnaces. ($6.0M)
- Capital Equipment ($0.3M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- AFB Technology Base
  - Continuation of AFB boiler demonstrations at Georgetown University, Great Lakes Naval Training Station and Shamokin. Also, financing of various AFB supporting technology projects such as sorbent enhancement, modeling, and operation of the Alexandria research facility. ($7.2M)
- PFB Combined Cycle Pilot Plant
  - Funding for continuation of the Curtiss-Wright project to design and construct a PFB combined cycle pilot plant. These funds continue the project pending Congressional approval of the revised budget proposals to terminate the project. ($8.9M)

## DEPARTMENT OF ENERGY
## FY 1982/1983 REVISED BUDGET

### FUEL CELLS
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Phosphoric acid systems development:** | | | | | | | | |
| Operating expenses | 10,100 | 15,823 | ... | ... | 10,100 | 15,823 | 10,000 | 12,745 |
| Subtotal | 10,100 | 15,823 | ... | ... | 10,100 | 15,823 | 10,000 | 12,745 |
| **Molten carbonate systems development:** | | | | | | | | |
| Operating expenses | 14,100 | 13,226 | -4,100 | -3,000 | 10,000 | 10,226 | 10,500 | 10,979 |
| Subtotal | 14,100 | 13,226 | -4,100 | -3,000 | 10,000 | 10,226 | 10,500 | 10,979 |
| **Advanced concepts:** | | | | | | | | |
| Operating expenses | 4,400 | 3,315 | -800 | -360 | 3,600 | 2,955 | 2,000 | 2,020 |
| Subtotal | 4,400 | 3,315 | -800 | -360 | 3,600 | 2,955 | 2,000 | 2,020 |
| **Total** | | | | | | | | |
| Operating expenses | 28,600 | 32,364 | -4,900 | -3,360 | 23,700 | 29,004 | 22,500 | 25,744 |
| Capital equipment | ... | ... | ... | ... | ... | ... | ... | ... |
| Fuel cells | 28,600 | 32,364 | -4,900 | -3,360 | 23,700 | 29,004 | 22,500 | 25,744 |

## DEPARTMENT OF ENERGY
## FUEL CELLS

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Continue cost-shared efforts to develop technology in the area of Phosphoric Acid Electric Utility Systems and Phosphoric Acid On-Site/Integrated Energy Systems and phosphoric acid technology base concepts development. ($10.1M)
- Continue molten carbonate technology development in the areas of hardware design concepts, electrolyte and electrode material development and gasifier cleanup technology. ($10.0M)
- Continue advanced concepts fuel cell technology development in the areas of solid oxide fuel cells and thermionic energy conversion. ($3.6M)

Changes from the March request:

- In molten carbonate program supporting materials investigations and development/testing of design concepts delayed, and contaminant specification investigations and system analysis work substantially deferred. ($-4.1M)
- In the area of advanced concepts, initiate termination of the thermionics program during FY 1982. ($-0.8M)

## DEPARTMENT OF ENERGY
## FUEL CELLS

### FY 1983 NARRATIVE JUSTIFICATION

**FY 1983 Request:**

Activities Funded:

- Phosphoric Acid Fuel Cells ($10.0M)
  - Electric Utility Systems ($6.6M)
  - OS/IES Systems ($2.0M)
  - Tech. Base plus Support ($1.4M)
- Molten Carbonate Fuel Cells ($10.5M)
  - Requires elimination of one contractor; no change in the scope of the technology base program. A single contractor will continue.
- Solid Oxide Fuel Cells ($2.0M)
  - Continuation of a full technology development program.

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- Advanced Concepts
  - Technology base development efforts associated with Thermionic Energy Conversion. FY 1982 funds allow program activities to continue until revised budget proposals are approved by Congress. ($2.1M)

### DEPARTMENT OF ENERGY
### HEAT ENGINES

### FY 1982 NARRATIVE JUSTIFICATION

**Revised Request Provides for:**

- In the area of Directly-fired Heat Cycles, continue development of advanced low $NO_x$, turbine combustors and ceramic coatings. ($6.5M)
- Phase out remaining open-cycle systems work. ($0.1M)
- Capital Equipment ($0.5M)

**Changes from the March request:**

- In the area of open-cycle systems, begin termination of high temperature turbine technology development, high temperature turbine testing, and verification testing. ($-9.0M)

## DEPARTMENT OF ENERGY
## HEAT ENGINES

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Low $NO_x$ Combustor Technology ($3.0M)
  - Continue Phase II, Combustor refinement and design, with several concepts concentrating on low/med Btu gas fuels and dual fuel capability. Combustor designs will involve high temperature capability but will be retrofitable to existing gas turbines.
- Materials Technology ($1.0M)
  - Continue the development of materials and coatings for gas turbines and diesel engines. The materials involved are erosion and corrosion resistant metals for gas turbine blading, and engine valves and cylinders. Coatings will protect high temperature components and allow increases in temperatures for improved efficiency. Materials and coatings research will contribute directly to higher efficiency, higher reliability and more economical operation of engines and turbines.
- Diesel Engines ($0.8M)
  - Continue the program through the Bartlesville Energy Technology Center to test low and medium speed engines with various coal/water slurry fuels. Program includes characterization of fuels, operation of engines with various fuels, examination of engine components, and the determination of some measure of engine wear vs ash content of the fuel.
- Instrumentation and Cooling Technology ($1.4M)
  - Continue program of developing instrumentation for measuring temperatures and particulate levels in the gas path of an operating gas turbine. Continue development of advanced cooling technology through laboratory testing.
- Capital Equipment ($0.2M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- None

# DEPARTMENT OF ENERGY
# UNDERGROUND COAL GASIFICATION

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Continue site tests near Centralia, WA to study initial cavity growth and to verify a steam/oxygen gasification test process. ($3.0M)
- Complete the larger scale, longer-term test of underground coal gasification of steeply dipping beds near Rawlings, WY. ($3.2M)
- Provide environmental support and compliance to in situ processes development. ($1.3M)
- Basic supporting research with universities and industry groups. ($0.8M)
- Capital Equipment ($0.3M)

Changes from the March request:

- None

## DEPARTMENT OF ENERGY
## UNDERGROUND COAL GASIFICATION

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Provides for legally-mandated environmental monitoring at past test sites.

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- Continuation of technology development program in underground coal gasification including efforts in medium-Btu gasification, steeply dipping beds, and supporting research. FY 1982 funding is provided for completion of these programs. ($8.6M)

## DEPARTMENT OF ENERGY
## FY 1982/1983 REVISED BUDGET

### HEAT ENGINES
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Central power systems: | | | | | | | | |
| Open-cycle systems | | | | | | | | |
| Operating expenses | 9,100 | 17,702 | -9,000 | -4,050 | 100 | 13,652 | ... | 6,550 |
| Subtotal | 9,100 | 17,702 | -9,000 | -4,050 | 100 | 13,652 | ... | 6,550 |
| Dispersed power systems: | | | | | | | | |
| Directly fired heat cycles | | | | | | | | |
| Operating expenses | 6,500 | 13,569 | ... | ... | 6,500 | 13,569 | 6,150 | 4,229 |
| Subtotal | 6,500 | 13,569 | ... | ... | 6,500 | 13,569 | 6,150 | 4,229 |
| Total | | | | | | | | |
| Operating expenses | 15,600 | 31,271 | -9,000 | -4,050 | 6,600 | 27,221 | 6,150 | 10,779 |
| Capital equipment | 450 | 248 | ... | ... | 450 | 248 | 200 | 221 |
| Heat engines | 16,050 | 31,519 | -9,000 | -4,050 | 7,050 | 27,469 | 6,350 | 11,000 |

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

## UNDERGROUND COAL GASIFICATION

(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Gasification technology development:** | | | | | | | | |
| Operating expenses | 6,200 | 1,192 | ... | ... | 6,200 | 1,192 | ... | 5,580 |
| Subtotal | 6,200 | 1,192 | ... | ... | 6,200 | 1,192 | ... | 5,580 |
| **Environmental and advanced research:** | | | | | | | | |
| Operating expenses | 2,100 | 1,800 | ... | ... | 2,100 | 1,800 | 700 | 1,336 |
| Subtotal | 2,100 | 1,800 | ... | ... | 2,100 | 1,800 | 700 | 1,336 |
| **Total** | | | | | | | | |
| Operating expenses | 8,300 | 2,992 | ... | ... | 8,300 | 2,992 | 700 | 6,916 |
| Capital equipment | 300 | 271 | ... | ... | 300 | 271 | ... | 84 |
| Underground coal gasification | 8,600 | 3,263 | ... | ... | 8,600 | 3,263 | 700 | 7,000 |

## DEPARTMENT OF ENERGY
## MINING R&D

## FY 1982 NARRATIVE JUSTIFICATION

**Revised Request Provides for:**

- Continue long range technology development for underground coal mining in the areas of mine development systems, room and pillar mining techniques and improved longwall mining technology. ($11.0M)

- Capital Equipment. ($0.5M)

**Changes from the March request:**

- Delay long term technology development in the area of underground coal mining. ($-4.0M)

## DEPARTMENT OF ENERGY
## MINING R&D

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- o Underground Coal Mining ($7.0M)
  - Economic and technical assessments by in-house personnel of advanced mining concepts for long-range Appalachia region mining and conduct three initial, assessment experiments.
  - Advanced high-payoff mining system automation effort.
  - Continue long-range trials of high-recovery and high efficiency, thick, dipping and thin seam mining.
  - Continue subsidence prediction effort to eliminate major land and environmental constraint on private industry mining capacity and, high-payoff, advanced ventilation investigations and cutting and drilling research.

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- o Underground Coal Mining
  - Continuation of selected industrial contract R&D projects. ($3.9M)

### DEPARTMENT OF ENERGY
### SURFACE COAL GASIFICATION

### FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Continue advanced process development efforts toward the establishment of a comprehensive technology data base for new gasifier concepts and gasification systems integration. ($5.8M)
- Continue systems engineering concepts directed toward development of gasification systems, optimization of process concepts, and fuller understanding of various components when integrated into an operational system. Gasifier systems studies include fixed-bed, entrained-bed, and fluid-bed systems. ($16.4M)
- Engineering development efforts expanded to increase gasifier process efficiency, reliability and control through the development of critical operational components, materials, and instrumentation. ($10.8M)
- Continue environmental studies and engineering analyses and support. ($7.9M)
- Capital Equipment. ($0.5M)

Changes from the March request:

- Systems Engineering Concepts/Gasifier Systems
  - Discontinue DOE participation in the catalytic gasification project. ($-9.0M)
  - Phase out of molten salt PDU operations test program. ($-1.550M)
  - Restrict studies related to environmental concerns and engineering analyses. ($-2.0M)

## DEPARTMENT OF ENERGY
## SURFACE COAL GASIFICATION

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Advanced Process Development ($4.3M)
  - Fundamental studies will be continued that contribute to completion of the data base for surface coal gasification. These studies will be directed towards establishing process mechanisms, kenetics, thermodynamics, coal properties, etc., that are needed to confirm design correlation.
  - Experimental studies will be performed to create data needed for confirmation and extrapolation of computer models.
  - New and novel gasification concepts will be investigation and developed up to and through the proof-of-concept stage.
- Systems Engineering Concepts/Gasifier Systems ($16.3M)
  - Continue studies on performance capabilities of fluidized bed and entrained bed gasification systems. Performance of typical systems will be reviewed through the operation of a fluidized bed as well as an entrained bed gasification PDU.
  - Continue development of an advanced, entrained bed slagging gasifier capable of utilizing all coals as suitable feedstock.
  - Continue operation of integrated fixed bed gasifier systems to determine how in-process streams and effluents can be varied/reduced as operational parameters are varied.
  - Continue the development of the Beacon Process, a new concept for the production of high-BTU gas from coal.
- Systems Engineering Concepts/Equipment and Instruments ($9.0M)
  - Continue studies on performance of key operational components, critical instrumentation and materials.
  - Development of new concepts in instrumentation and operating components that have the potential to increase operational reliability, systems control and conversion efficiencies.
  - Continue development of material application experiments.
- Environment and Engineering Analysis/Environmental Studies ($4.7M)
  - Continue studies on environmental impacts associated with operation of a coal gasification facility.
  - Continue investigation of performance of coal gasification clean-up system operating under transient (end-use) conditions.
  - Continue health and safety studies concentrated on various types of operational equipment and its resulting contribution on fugitive emissions and worker health.

- Continue water studies on characterization, control and clean-up of gasifier effluent stream. These data are essential in determining the impact associated with a "zero effluent" concept for gasification facility design, and operation.

- Environment and Engineering Analyses/Engineering Analysis ($6.0M)

  - Continue engineering support activities for the joint DOE/GRI program.
  - Completion of technical evaluations and analyses of various surface coal gasification projects.
  - Correlation of engineering scale-up criteria with available experimental data.
  - Verify and update the technical data base for surface coal gasification, management and recall system will be further improved.
  - Activities required for management support and project management services will be continued.

- Capital Equipment ($0.6M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- None

## DEPARTMENT OF ENERGY
## UNCONVENTIONAL GAS RECOVERY

### FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Continue planning of Devonian shale mineback facilities, and initiate in situ stimulation experiments. ($1.6M)
- Complete western gas sands drilling, coring, logging and preliminary reservior production testing of two wells at the Multiwell Experiment site in the Piceance Basin, Colorado. ($5.0M)
- Prepare environmental assessments on field experiments. ($0.4M)
- Capital Equipment. ($0.2M)

Changes from the March request:

- Terminate methane from coalbeds subprogram including ongoing fracturing research on integrity of mine roofs and two technology utilization tests on methane from coalbeds. ($-1.0M)
- Delay several planned multi-well experiments in the Western tight gas sands project. ($-1.0M)
- Defer indefinitely the excavation of Devonian shale mineback facilities. ($-1.0M)

# DEPARTMENT OF ENERGY
# UNCONVENTIONAL GAS RECOVERY

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- o Multiwell Operations - Research using the two wells in the multiwell experiment (MWX) will continue with analysis of core taken from the first well, stress measurements in the second well, and associated diagnostics to characterize the gas-bearing lenses. These activities will lead to accurate methods for measuring tight sands properties and characterization of lens distributions. Two stimulations will be designed and carried out. General site operations and maintenance are included. ($3.2M)
- o Supporting Research - Research that is intended to support and integrate with the MWX will continue through laboratory and theoretical studies and through mineback experiments at the Nevada Test Site (NTS). This includes the development of new instruments for measuring water saturation and in-situ stresses, rock mechanics, lab tests and modeling for fracture control, and studies of the behavior of improved proppants and fluids. Tests at the NTS will verify important theories under semi-realistic conditions for subsequent testing in the MWX. The results of all this research will guide the design of the MWX experimental phases. ($7.3M)
- o Environmental Support - The extraction of gas from tight sands has very little adverse environmental impact except for temporary disturbance of the surface. The environmental effects of MWX operations are being studied and referenced against baseline observations. ($0.2M)
- o Capital Equipment ($0.3M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- o Eastern Gas Shales
  - Completion of an "offset well" test to provide data on the effect of reservoir nonuniformities and natural fractures upon gas production rates and shale well spacings. ($1.6M)

## DEPARTMENT OF ENERGY
## FY 1982/1983 REVISED BUDGET

### MINING R&D
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Underground coal mining: | | | | | | | | |
| Operating expenses | 15,000 | 46,856 | -4,050 | -13,965 | 10,950 | 32,891 | 7,000 | 17,332 |
| Subtotal | 15,000 | 46,856 | -4,050 | -13,965 | 10,950 | 32,891 | 7,000 | 17,332 |
| Total | | | | | | | | |
| Operating expenses | 15,000 | 46,856 | -4,050 | -13,965 | 10,950 | 32,891 | 7,000 | 17,332 |
| Capital equipment | 500 | 478 | ... | ... | 500 | 478 | ... | 127 |
| Mining research and development | 15,500 | 47,334 | -4,050 | -13,965 | 11,450 | 33,369 | 7,000 | 17,459 |

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DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

## SURFACE COAL GASIFICATION
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Advanced process development:** | | | | | | | | |
| Operating expenses ........................ | 5,750 | 15,836 | ... | ... | 5,750 | 15,836 | 4,250 | 4,158 |
| Subtotal ........................ | 5,750 | 15,836 | ... | ... | 5,750 | 15,836 | 4,250 | 4,158 |
| **Systems engineering concepts:** | | | | | | | | |
| Gasifier systems | | | | | | | | |
| Operating expenses ........................ | 26,990 | 39,197 | -10,550 | -6,595 | 16,440 | 32,602 | 16,300 | 23,785 |
| Equipment/instrumentation concepts | | | | | | | | |
| Operating expenses ........................ | 10,775 | 8,850 | ... | ... | 10,775 | 8,850 | 8,975 | 8,286 |
| Construction ........................ | ... | 49,081 | ... | ... | ... | 49,081 | ... | ... |
| Subtotal ........................ | 37,765 | 97,128 | -10,550 | -6,595 | 27,215 | 90,533 | 25,275 | 32,071 |
| **Environmental and engineering analyses:** | | | | | | | | |
| Environmental studies | | | | | | | | |
| Operating expenses ........................ | 4,050 | 4,855 | ... | ... | 4,050 | 4,855 | 4,665 | 3,038 |
| Engineering analyses/support | | | | | | | | |
| Operating expenses ........................ | 5,875 | 10,441 | -2,000 | -3,000 | 3,875 | 7,441 | 5,971 | 5,949 |
| Subtotal ........................ | 9,925 | 15,296 | -2,000 | -3,000 | 7,925 | 12,296 | 10,636 | 8,987 |
| **Total** | | | | | | | | |
| Operating expenses ........................ | 53,440 | 79,179 | -12,550 | -9,595 | 40,890 | 69,584 | 40,161 | 45,216 |
| Capital equipment ........................ | 550 | 514 | ... | ... | 550 | 514 | 600 | 557 |
| Construction ........................ | ... | 49,081 | ... | ... | ... | 49,081 | ... | ... |
| Surface coal gasification ................ | 53,990 | 128,774 | -12,550 | -9,595 | 41,540 | 119,179 | 40,761 | 45,773 |

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

UNCONVENTIONAL GAS RECOVERY
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Eastern gas shales:** | | | | | | | | |
| Operating expenses | 2,600 | 8,998 | -1,000 | -1,000 | 1,600 | 7,998 | ... | 6,499 |
| Subtotal | 2,600 | 8,998 | -1,000 | -1,000 | 1,600 | 7,998 | ... | 6,499 |
| **Western tight gas sands:** | | | | | | | | |
| Operating expenses | 6,000 | 7,979 | -1,000 | -1,000 | 5,000 | 6,979 | 10,511 | 8,529 |
| Subtotal | 6,000 | 7,979 | -1,000 | -1,000 | 5,000 | 6,979 | 10,511 | 8,529 |
| **Methane from coalbeds:** | | | | | | | | |
| Operating expenses | 1,000 | 2,085 | -1,000 | -1,000 | ... | 1,085 | ... | 2,489 |
| Subtotal | 1,000 | 2,085 | -1,000 | -1,000 | ... | 1,085 | ... | 2,489 |
| **Environmental and advanced research:** | | | | | | | | |
| Operating expenses | 400 | 570 | ... | ... | 400 | 570 | 189 | 156 |
| Subtotal | 400 | 570 | ... | ... | 400 | 570 | 189 | 156 |
| **Total** | | | | | | | | |
| Operating expenses | 10,000 | 19,632 | -3,000 | -3,000 | 7,000 | 16,632 | 10,700 | 17,673 |
| Capital equipment | 200 | 200 | ... | ... | 200 | 200 | 300 | 342 |
| Unconventional gas recovery | 10,200 | 19,832 | -3,000 | -3,000 | 7,200 | 16,832 | 11,000 | 18,015 |

## DEPARTMENT OF ENERGY
## FY 1982/1983 REVISED BUDGET

### ADVANCED PROCESS TECHNOLOGY
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| **Advanced exploratory research:** | | | | | | | | |
| **Operating expenses** ............................ | 3,700 | 3,482 | ... | ... | 3,700 | 3,482 | 2,500 | 4,573 |
| **Subtotal** ................................ | 3,700 | 3,482 | ... | ... | 3,700 | 3,482 | 2,500 | 4,573 |
| **Arctic and offshore technology:** | | | | | | | | |
| **Operating expenses** ............................ | ... | 609 | ... | ... | ... | 609 | 1,744 | 785 |
| **Subtotal** ................................ | ... | 609 | ... | ... | ... | 609 | 1,744 | 785 |
| **Total** | | | | | | | | |
| **Operating expenses** ............................ | 3,700 | 4,091 | ... | ... | 3,700 | 4,091 | 4,244 | 5,358 |
| **Capital equipment** ............................ | 500 | 634 | ... | ... | 500 | 634 | 256 | 296 |
| **Advanced process technology** ............... | 4,200 | 4,725 | ... | ... | 4,200 | 4,725 | 4,500 | 5,654 |

## DEPARTMENT OF ENERGY
## ADVANCED PROCESS TECHNOLOGY

### FY 1982 NARRATIVE JUSTIFICATION

**Revised Request Provides for:**

- Continuation of activity in microbial processes and advanced exploratory research. ($1.0M)
- Expansion and continuation of reference fuels and characterization projects on the utilization of synthetic and conventional crudes as well as crude oil products. ($2.0M)
- Efforts in heavy oil upgrading, stability and performance. ($0.7M)
- Capital Equipment. ($0.5M)

**Changes from the March request:**

- None

## DEPARTMENT OF ENERGY
## ADVANCED PROCESS TECHNOLOGY

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- o Advanced Exploratory Research ($2.5M)
  - Evaluate innovative extraction and processing technologies for oil, gas and shale for both surface and in-situ processes. ($0.5M)
  - Develop thermodynamic data base for select compounds occurring in synthetic fuels. ($0.4M)
  - Update existing data base on crude oil, shale oil and products. ($1.1M)
  - Produce and test small quantities of new mobility/reference fuels. ($0.5M)
- o Arctic and Offshore Technology ($1.7M)
  - Investigate, develop methodology for determining properties, structure, dynamics and failure modes of Arctic ice formations. ($0.5M)
  - Characterize Arctic and continental offshore subsea soils and assess effects of external forces on these seafloor zones. ($0.4M)
  - Collect, analyze and correlate Arctic and ocean environmental and engineering data; develop data base and modeling techniques. ($0.4M)
  - Identify and develop advanced deep water technology. ($0.4M)
- o Capital Equipment ($0.3M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- o None

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

ENHANCED OIL RECOVERY
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Heavy oil: | | | | | | | | |
| Operating expenses | 7,100 | 8,177 | ... | ... | 7,100 | 8,177 | 4,300 | 6,705 |
| Subtotal | 7,100 | 8,177 | ... | ... | 7,100 | 8,177 | 4,300 | 6,705 |
| Light oil: | | | | | | | | |
| Operating expenses | 8,000 | 14,947 | -2,000 | -1,500 | 6,000 | 13,447 | 8,900 | 10,705 |
| Subtotal | 8,000 | 14,947 | -2,000 | -1,500 | 6,000 | 13,447 | 8,900 | 10,705 |
| Tar sands: | | | | | | | | |
| Operating expenses | 5,000 | 4,356 | ... | ... | 5,000 | 4,356 | 5,000 | 4,686 |
| Subtotal | 5,000 | 4,356 | ... | ... | 5,000 | 4,356 | 5,000 | 4,686 |
| Total | | | | | | | | |
| Operating expenses | 20,100 | 27,480 | -2,000 | -1,500 | 18,100 | 25,980 | 18,200 | 22,096 |
| Capital equipment | 750 | 676 | ... | ... | 750 | 676 | 500 | 544 |
| Enhanced oil recovery | 20,850 | 28,156 | -2,000 | -1,500 | 18,850 | 26,656 | 18,700 | 22,640 |

# DEPARTMENT OF ENERGY
# ENHANCED OIL RECOVERY

## FY 1982 NARRATIVE JUSTIFICATION

**Revised Request Provides for:**

- Continuation and completion of Downhole Steam Generator development including twelve month field test and related steam injection projects. ($6.0M)
- Continuation of university research on advanced heavy oil recovery processes. ($1.1M)
- Continuation of collection and analysis of data under ERA incentive tests and other light oil recovery projects. ($4.4M)
- Continue tar sand resource characterization and continue second field experiment of steam drive in Utah tar sands focusing on thermal methods. ($5.0M)
- Continue university research on advanced chemical and carbon dioxide flooding processes. ($1.6M)
- Capital Equipment. ($0.8M)

**Changes from the March request:**

- Reduce data analysis and field validation efforts and reduce university efforts by 50%. ($-2.0M)

## DEPARTMENT OF ENERGY
## ENHANCED OIL RECOVERY

## FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- o Light Oil ($8.9M)
  - Continue in-house advanced research and development on chemical flooding and miscible gas processes. ($5.0M)
  - Continue fundamental research on chemical flooding light oil EOR in leading universities. ($1.5M)
  - Continue fundamental research in miscible gas light oil EOR in leading universities. ($0.8M)
  - Provide data for analysis of 400 incentive tests to select the most significant technically, and perform model analysis on those selected. ($1.6M)
- o Heavy Oil ($4.3M)
  - Continue fundamental, long range university R&D on basic understanding of behavior on in-situ combustion and advanced concepts in steam flooding with mobility control with ancillary materials. ($1.6M)
  - Conduct basic R&D and field testing of high temperature front tracking (steam flooding and in-situ combustion) and in steam quality measurements. ($1.0M)
  - Complete evaluation and development of thermally efficient well string components and complete testing of the newly developed aluminum packer. ($1.1M)
  - Continue advanced research on high pressure combustion of crude oil in downhole steam generators to allow eventual of crude oil instead of natural gas or diesel oil. ($0.6M)
- o Tar Sands ($5.0M)
  - Conduct a field experiment involving a reverse in situ combustion followed by steam drive. ($4.0M)
  - Environmental monitoring and effluent characterizations and R&D on control and disposal technologies. ($0.6,)
  - Fundamental research on novel extraction techniques. ($0.4M)
- o Capital Equipment ($0.5M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- o None

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

## OIL SHALE
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Oil shale technology base: | | | | | | | | |
| Operating expenses | 14,150 | 22,471 | ... | ... | 14,150 | 22,471 | 13,557 | 15,689 |
| Subtotal | 14,150 | 22,471 | ... | ... | 14,150 | 22,471 | 13,557 | 15,689 |
| Environmental mitigation: | | | | | | | | |
| Operating expenses | 2,100 | 2,309 | ... | ... | 2,100 | 2,309 | 2,600 | 2,510 |
| Subtotal | 2,100 | 2,309 | ... | ... | 2,100 | 2,309 | 2,600 | 2,510 |
| Total | | | | | | | | |
| Operating expenses | 16,250 | 24,780 | ... | ... | 16,250 | 24,780 | 16,157 | 18,199 |
| Capital equipment | 1,000 | 958 | ... | ... | 1,000 | 958 | 600 | 711 |
| Oil shale | 17,250 | 25,738 | ... | ... | 17,250 | 25,738 | 16,757 | 18,910 |

## DEPARTMENT OF ENERGY
## OIL SHALE

## FY 1982 NARRATIVE JUSTIFICATION

Revised Request Provides for:

- Develop improved data on oil shale retorting kinetics and mechanisms. ($3.5M)
- Develop advanced retorting process concepts for improved efficiency and reduced environmental impact. ($1.5M)
- Develop more accurate and reliable instrumentation and analytical techniques for process control and environmental characterization. ($1.2M)
- Support for experimental and mathematical models of shale oil retorting. ($3.5M)
- Evaluate impact of large scale spent shale disposal and continue Eastern shale geochemical analysis activity. ($0.9M)
- Support R&D on environmental impact and control for shale oil development. ($2.0M)
- Develop improved data on explosive fracturing of oil shale. ($3.7M)
- Capital Equipment. ($1.0M)

Changes from the March request:

- None

DEPARTMENT OF ENERGY
OIL SHALE

FY 1983 NARRATIVE JUSTIFICATION

FY 1983 Request:

Activities Funded:

- Oil Shale Technology Base ($13.6M)
  - Chemistry and Physics - Continue to explore the kinetics and mechanisms of key reactions (such as kerogen decomposition, mineral decomposition and pollutant evolution) under various conversion proccess conditions to enable design of new process concepts. ($3.8M)
  - Novel Concepts - Competitively solicit novel retort concepts for environmental mitigation through process design techniques and continue research on the $SO_3$ concept for providing retort heat chemically and low void retorting to define minimum operating parameters. ($1.9M)
  - Fragmentation - Conduct laboratory and engineering scale research on the interaction of oil shale of various grades and bedding plane orientations with the dynamic loading exerted by various types of explosives, to develop a predictive computer model for designing in-situ retorts. ($3.9M)
  - Eastern Oil Shale - Complete projects to be initiated under a FY 1981 Program Research and Development Announcement (PRDA), initiate follow-on contracting based on results of these projects, and expand the inhouse research on chemistry and physics and fragmentation of shale to include Eastern shales. ($2.3M)
  - Downhole Steam Generator - Begin development and testing of a downhole steam generator (DSG) for higher-efficiency delivery of superheated steam to the leached-zone shales in Colorado. ($1.7M)
- Environmental Mitigation ($2.6M)
  - Characterize emissions and wastes from retorting processes so that environmental mitigation procedures can be designed, developed and evaluated; and design, develop,and test such procedures for water, air and solid waste. This activity also includes required environmental compliance at past and present DOE research sites. ($2.6M)
- Capital Equipment ($0.6M)

Activities not funded in FY 1983 which are included in the FY 1982 revised budget request:

- None

DEPARTMENT OF ENERGY
FY 1982/1983 REVISED BUDGET

## PROGRAM DIRECTION
(dollars in thousands)

| | FY 1982 Request | | Change | | Revised FY 1982 Budget | | Revised FY 1983 Request | |
|---|---|---|---|---|---|---|---|---|
| | B/A | B/O | B/A | B/O | B/A | B/O | B/A | B/O |
| Salaries, benefits and travel: | | | | | | | | |
| Operating expenses .......................... | 14,600 | 14,600 | ... | ... | 14,600 | 14,600 | 14,400 | 14,400 |
| Subtotal .......................... | 14,600 | 14,600 | ... | ... | 14,600 | 14,600 | 14,400 | 14,400 |
| Total | | | | | | | | |
| Operating expenses .......................... | 14,600 | 14,600 | ... | ... | 14,600 | 14,600 | 14,400 | 14,400 |
| Program Direction, Headquarters .......... | 14,600 | 14,600 | ... | ... | 14,600 | 14,600 | 14,400 | 14,400 |

## ENERGY TECHNOLOGY CENTERS

Mr. MURTHA. The Assistant Secretary for Fossil Energy has recommended termination of at least three of the energy technology centers. In fact, the budget justification shows the $45 million appropriated in 1982 will pay for closeout costs of 1983.

Have you made a decision on the energy technology center closings?

Mr. MARES. We made a recommendation that we not continue with the three western centers as Federal sites. In fact, what I have done in talking with the congressional delegations as well as to each of the authorizing and appropriating committee staffs was to review with them the reasons for that recommendation and at the suggestions of the congressional delegations have, in fact, had conversations with the University of North Dakota of the Grand Forks site on the possibility of transferring that facility to the University. The university would conduct research activities, some for us and then some either in connection with their academic purposes or as a research institute for others.

We have had similar conversations with the University of Wyoming along the same lines. In both cases, the laboratories were physically adjacent to the universities. Based on conversations with a delegation from the community in Bartlesville and the Congressmen from Oklahoma, I have become aware of five different firms, two not-for-profit and three for profit that would be interested in trying to come up with some similar institute at that location.

Since we have requested funds for research in the areas of oil shale in 1983, we would be prepared to enter into a contract with such a new institution to conduct research for us, the Government, in addition to the other work that they may want to conduct for their own purposes.

Mr. MURTHA. We have some questions about MHD, Mr. Whitten is going to be over and I will defer to him on that subject.

## PRIVATE INDUSTRY VIEWS ON ENERGY R. & D.

We have a number of letters here from people who are representing businesses which have been doing research and development. The clear tone of these letters is that they will not be able to continue without Federal support or if they can continue it will be at a much slower pace.

If I may quote from some, "Most small businesses have neither the financial resources nor the cash flow."

Another says, "In the event the U.S. Department of Energy participation is discontinued as predicted, the eventual commercial acceptance of conversion of waste to fuel oil will be delayed significantly, perhaps three or four years."

And from the cement industry, "There is no indication that the economy of the cement industry has or is about to improve, and increased support for the laboratories is not anticipated in the predictable future."

Browning-Ferris Industries writes, "Because BFI is a publicly held, profit-making company, prudent management only takes risks when the potential benefit far exceeds these risks. Funding of the waste-to-energy projects by your office has removed the potential problems and allowed the research to go forward."

These comments, I think, provide the flavor of the letters that we have received. Let me submit these letters for the record and then you can look these over.

[The letters follow:]

## SUMMARY OF PRIVATE INDUSTRIAL SECTOR VIEWS ON ASSUMING R&D ON ITS OWN WITHOUT FEDERAL SUPPORT

The attached documentation represents relatively recent views of individual industrial concerns regarding R&D by industry alone. The views are both in general and as relating to specific projects either underway or being considered. The attached collection is actually only the beginning since it is now the policy of the industrial energy conservation program to require specific statements by the proposers as to why they would not or could not conduct the proposed activities entirely on their own.

ALUMINUM COMPANY OF AMERICA
ALCOA TECHNICAL CENTER
ALCOA CENTER, PA 15069
(412) 339-6651

1982 February 11

Dr. Michael B. McNeil
U. S. Department of Energy
Forrestal Building, Room 2H075
Mail Stop 2H086
Washington, DC 20585

Dear Dr. McNeil:

Subject: Contract DE-AC01-77CS-40079

Modification M017 establishes 1982 February 28 as the completion date for the subject contract. As you know, experimental work was concluded in 1981 and efforts over the past several months have been exclusively devoted to analysing data and preparing the final report. We anticipate receiving acceptance of the draft report from Government reviewers in time to issue the final report by February 28. Having done so, Alcoa has no immediate plan to continue work on this program. However, we shall continue to monitor emerging technology which could warrant reconsideration of in-house activity. Obviously, any renewed interest by Alcoa would reflect a management decision that additional R&D expenditures would likely result in a process of commercial value. Presumably, the Government would also be receptive to future relationships with industry which would encourage the implementation of direct reduction technology.

As Noel Jarrett has stated to you and others in the DOE many times, the mutual decision to conclude work on this contract does not mean that Alcoa has forever abandoned the idea of being able to reduce aluminum by some direct process. Granted the members of the project team who have worked on this contract will be assigned to other R&D projects in March of this year. This does not mean that they or others would not ever be called upon to further explore or develop a direct reduction process. Alcoa already has a significant investment in this technology and R&D management would surely like to see it contribute to the good of the Corporation.

Hopefully these comments will answer your question of 1982 Feburary 05 concerning Alcoa's proposed program on direct reduction after 1982 February 27. If further clarification is needed, please let me know.

Yours very truly,

D Jack George

D. Jack George
Manager, R&D Contracts
Technology Marketing Division
Alcoa Laboratories

DJG:cjc

**LI·CON, Inc. (LIQUID CONDITIONERS)**

P. O. BOX 10717 • PENSACOLA, FLORIDA 32504 • TEL. 904/477-0334
477-0190

January 27th 1982

4406 Mahan Rd
Silver Spring, Md 20906

Mr. Stuart Natof
Office of Industrial Programs
Department of Energy
Washington, DC 20585

Contract Funding

Dear Stu:

There are reports circulating that the Department may decide that contractors should assume the remaining costs for their government funded R&D projects despite the facts that funds have already been committed by DOE. For a small business contractor, such as we are, this decision would be disastrous. Most small business have neither the financial resources nor the cash flow to assume whatever the remaining costs are and the contract would have to be terminated immediately. The results would be an unconscionable waste of the taxpayer's money already spent and very likely the Department would be guilty of violating contract terms.

LICON is now in the final stages of our R&D effort to develop an energy efficient system for industrial aqueous wastes treatment. To stop now means the waste of over $200,000. We simply could not pick up the needed remaining costs to complete the development and we might be in a serious legal bind with our industrial sponsor with whom we have signed agreements. He has already made commitments to the project.

I fail to see any advantage, financial or otherwise, to the Government to cause small business firms to assume or try to assume the remaining development costs. I think the consequential legal problems are too complex to consider.

Renegotiating our contract with DOE cannot be a possibility since we fully stated condition and financial abilities at the very beginning.

Sincerely,
Ed
Edgar A. Cadwallader PE
LICON Washington representative.

cc: Mr. W.R. Williamson President LICON Pensacola

PROCEDYNE
CORP.

February 9, 1982

U.S. Dept. of Energy CE-121.2
Mail Stop 6G-030
1000 Independence Ave., S.W.
Washington, DC 20585

Attn: Mr. Bruce Cranford

Re: Waste Plastics to Fuel Program

Dear Mr. Cranford,

We have heard that the administration budget for the U.S. Department of Energy for fiscal year starting October, 1982 is contemplated to be essentially zero.

If this is the case, it will have a major adverse affect on the program to convert a significant portion of waste plastics generated in this country to commercial grade fuel.

In 1975, when Procedyne presented the program to the U.S. Department of Energy, the following factors summarize the situation with respect to recovering fuel oil from waste plastics:

1. The technical feasibility of converting atactic polypropylene (by product plastic) to fuel oil by a pyrolysis process had been demonstrated on a small scale.

2. Economic considerations indicated that a pyrolysis process to convert waste plastic to commercial grade fuels would provide a sufficient return on investment to be financed by private capital once the technical risk was eliminated. However, the technical risk was sufficiently great to deter commercial interests from this activity despite the fact that it would make an important contribution to the energy needs of the country while eliminating a difficult waste disposal problem of a non-biodegradable material.

**PROCEDYNE**
**CORP.**

February 9, 1982
Page 2

Attn: Mr. Bruce Cranford

The participation of the U.S. Department of Energy by sharing the technical risk with private industry made the start of the program possible. This participation has resulted in a successful large scale demonstration plant to prove technical feasibility which in turn resulted in the first commercial plant in this country converting waste atactic plastic to fuel oil. It is important to note that private industry provided the capital for this first commercial plant with the U.S. Department of Energy sharing the technical risk.

The feasibility of converting waste plastic to fuel oil has been demonstrated, however, there is still sufficient technical risk to prevent major movement of private industry into this area. Another major chemical company is well along in considering the use of this process on a commercial scale with still another giving preliminary consideration to the process. The present participation of the U.S. Department of Energy in sharing the technical risk is an important element in maintaining momentum of the program.

In the event that U.S. Department of Energy participation is discontinued, it is predicted that the eventual commercial acceptance of conversion of waste plastics to fuel oil will be delayed significantly, perhaps three or more years. Significant economic benefit to the country will be lost and environmental benefits will be lost. Since this effort by the U.S. Department of Energy is well along toward achieving the benefits that formed the original justification for the program, it would be most unfortunate to discontinue participation at this time.

Yours truly,

Dr. H. Kenneth Staffin
President

HKS/jkb

11 February, 1982

Dr. Jerome Collins C.E. 121.2
Office of Industrial Programs
Department of Energy
Forrestal Bldg.
1000 Independence Ave., SW
Washington, D.C. 20585

Ref: DOE Contract DE-AC03-78-ET-13148

Peabody Gordon-Piatt

Dear Dr. Collins:

In the context of our recent ongoing discussions about the difficulty we have encountered in locating prospective hosts, this letter is intended to inform you of our assessment of this activity.

Peabody Gordon-Piatt, like other organizations aware of energy supply and demand trends, is certain that the cost of conventional fuels (oil and gas) is going to continue to rise. These costs are expected to follow the trend of inflation until the state of the economy improves, at which time they are expected to increase at an increasing rate.

We have chosen to fight increasing fuel costs by proving that in-plant generated dry composite waste is a commercially applicable substitute. The project will demonstrate that burning this waste will also reduce disposal costs and increase landfill life. Under a normal economic climate, such proof would convince profit oriented commercial and industrial plants to retrofit their existing oil or gas fired energy systems. Experience in parallel activities indicates that paybacks of 2 to 3 years are usual as a result of such a retrofit. Although net profit may be the incentive for the individual plant, reducing the consumption of oil or gas is the national objective.

We are not in a normal economic climate, however, and unless paybacks of 9 months to 1½ years can be clearly demonstrated, management is not making any unnecessary capital investments. This describes the barrier we have met in attempting to find host sites willing to pay for the equipment necessary to accomplish a suitable retrofit within the prescribed time period.

We believe that in about six months the economic climate will begin to improve considerably and as a result the use and cost of energy will also increase. The investment to date in time and effort toward the stated objective warrants expanding the search for prospective host sites so that we have the data to prove the benefits of such a retrofit.

Although we believe that our efforts have been commensurate with the task, we had confined our search to the three S.I.C. Groups identified in Tasks I and II of the project. As you know, we have expanded our search to additional S.I.C. Groups.

We believe that any reduction in contract effort at this time would be counter-productive for the following reasons:

- The contract team and possibly even the full scale burn test facility could be dissipated and difficult, if not impossible to reassemble.
- The discontinuity in progress would make a restart expensive and cause considerable unnecessary delay in achieving the objective of saving oil and gas by such retrofitting.
- Continuation of this effort helps the public remain aware of the requirement and that a solution exists that needs only to be demonstrated.
- This is a truly unique program. Many commercial and industrial plants generate composite (non-homogeneous) waste but burn oil or gas to meet their energy needs. Industry has shown no significant effort to develop the use of this alternate fuel, however. A retrofit of the type this project is directed toward, has wide application.

As stated, we have expanded and intensified our search for prospective host sites where the benefits from such a retrofit can be demonstrated. I trust that our effort meets with your approval. Your suggestions will be welcomed.

Sincerely,

L. G. (Lee) Desmon

L. G. Desmon
Technical Manager
D.O.E. Contract DE-AC03-78-ET-13148

LGD/mr
copy: Ezra Gordon, President

construction technology laboratories
a Division of the PORTLAND CEMENT ASSOCIATION
5420 Old Orchard Road, Skokie, Illinois 60077 • Phone 312/966-6200

February 8, 1982

Dr. Michael B. McNeil
Program Manager
U.S. Department of Energy
66090 Forrestal Building, CE-122
1000 Independence Avenue, S.W.
Washington, DC 20585

Dear Mike:

Your question relative to the action that would be taken by the Construction Technology Laboratories in the event funding of the "Particle Size" project was suspended is very easy to answer. We would stop work immediately and prepare termination charges at the earliest possible time.

I realize that you are cognizant of the fact that CTL is a division of a not-for-profit organization and has very limited funds with which to operate. The CTL is a research, development and technical service agency and our staff and equipment are available on a contract basis to government and industry. Also, the current project "Energy Conservation Potential of Portland Cement Particle Size Distribution Control, Phase II" is being performed under a cooperative agreement and the CTL is providing 15% of the cost.

The CTL operates within facilities that were originally constructed for research and development projects funded by members of the Portland Cement Association. But in 1969, as a result of adverse economic conditions, the support of the industry was drastically reduced and the services of the laboratories were offered to governmental agencies, all of private industry and the public in general on a contract basis. This has continued to the present time. Currently less than 25% of our work is supported by the Portland Cement Association and over 75% is performed on a contract basis. There is no indication that the economy of the cement industry has or is about to improve, and increased support for the laboratories is not anticipated in the predictable future.

The project in question will provide data for a breakthrough in the specification of portland cement, the cementing material used in concrete which is required in 90% of all construction projects in the United States. The energy savings and economic benefits that will result from the project will accrue to the depressed construction industry.

Any delay, reduction or suspension of funds for the particle size control project will have a serious effect on the research program and staff of a research organization of our size. Although you are familiar with the CTL organization, if I can be of service please feel free to call on me.

Yours very truly,

George K. McCord

George K. McCord, Director
Project Development

GKMcC/lg
BA-1155-4000

Copy to -
W. E. Kunze

Rainier
Engineering

4 February 1982 DOE:MJS:82/2

Mr. Jerome F. Collins
Waste Products Utilization Branch
CE 121.2
Department of Energy
Forrestal Building
Washington, D.C. 20585

Dear Mr. Collins:

This letter is in response to your question regarding the likelihood of the private sector picking up the funding of the research presently being conducted on the recovery of ethylene glycol from used antifreeze.

It is my opinion that at this stage of the project the research would not be continued if funding had to be supplied by the private sector. While this project is very appealing from an overall energy savings standpoint, it is one which will need government funding to support the research until it is proven that ethylene glycol recovery is both environmentally sound and economically practical. A major reason for this opinion is that it is common practice today to dump used antifreeze into the sewer or storm drain. Disposal of used antifreeze does not present a problem to individuals or to service stations or other businesses which handle the material. Because disposal of used antifreeze is not a problem, the amount of this material available for recycle is unknown. The amount available is a major variable in the economic feasibility analysis.

I doubt that the private sector will undertake a study of this nature which deals with the disposal of a substance which is not currently regulated when it has to deal with environmental problems associated with the disposal of other materials which are regulated.

It is important that the government funding of this research be continued until the fundamental environmental and economic questions have been answered. Once the process has been shown to be economically feasible, I am confident that the private sector would proceed to fund and operate plants to recover the ethylene glycol.

Sincerely,

Michael J. Strand

Michael J. Strand, Ph.D.
President

MJS:tk

1518 Northeast 143rd Street • Seattle, Washington 98125 • (206) 365-0761

SIDBEC
507, Place d'Armes, Montréal, Québec H2Y 2W8

January 5, 1982

Dr. James Fulton
U.S. Department of Energy
Division of Industrial Energy
Conservation
CE 121.3
Forestall Building
Washington, DC 20585

RE: Mathematical Modelling of
Electric Arc Furnaces

Dear Jim,

Following up on the meeting at MIT on December 3, 1981, this is to indicate to you our interest in this development program. Certainly, this project sponsored by the U.S. Department of Energy has permitted an improved understanding of the behaviour of electrical plasmas. From a practical view point, it is important that additional measurements are made in an industrial environment to permit further validation or modification of the models developed. I certainly hope that this further step in the research program can find adequate sponsorship.

I have already indicated to Dr. Julian Szekely that I would be prepared to participate in any discussions on how this program might be continued.

It was good to have the chance of seeing you again at MIT and I would like to take this opportunity to convey my best wishes for the New Year.

With kind personal regards,

Terence E. Dancy
Vice-President
Technology

TED/mh

c.c.: Dr. J. Szekely

LI·CON, Inc. (LIQUID CONDITIONERS)
P. O. BOX 10717 • PENSACOLA, FLORIDA 32504 • TEL. 904/477-0334

March 25th 1981

The Energy and Water Development Subcommittee

Mr. Chairman and members of the subcommittee:

I am Edgar Cadwallader, a registered chemical engineer, representing a small business firm, LICON of Pensacola, Florida. We engineer and manufacture equipment for saline water conversion, water pollution abatement, and mineral recovery. I am here this afternoon to speak to the committee about energy conservation and its importance to the nation's overall energy policies for energy independence. I am also speaking about the importance of small business firms and how much of the nation's innovative ideas come from them.

About eighteen months ago we entered into a contract with the Alternative Materials Utilization Branch of the Office of Industrial Programs in DOE to design and build energy efficient equipment for treating electroplating wastes. Because the Department of Defense has environmental problems in its electroplating shops, the Navy contributed about half of the funds for this development. We were highly successful for our machines not only solved an environmental problem, it saved energy and recovered expensive and strategic minerals such as chromium. The savings will result in a return of the capital investment in under three years. Our machine is now being installed at the Naval Air Station in Pensacola. As our nation's forces build up, there will be greater need and incentive to conserve energy and recover valuable minerals.

Mr. Chairman, let me emphasize one fact about the Government's R&D programs. There has been entirely too many "studies and reports" which repose on bureaucratic shelves and contribute little to advancing science and engineering. We produced a machine to which the Government has rights and which in application will return the original investment many times over.

Today, our nation needs innovation and the small business firms across this country supply more than their proportionate share of ideas. However, small businesses do not always have the ready capital to invest. We are not like the DuPonts, the Dow Chemicals, the Exxons with enormous capital reserves. They dont need Government support. But the Government can step in and give qualified support to small businesses and the return to the taxpayer will be many fold.

The development program we have completed for the Department of Energy and the Navy points to an extension of the technology for application in the chemical and the nuclear industries. For this second phase, we have an industrial sponsor besides the military, and of course we wish to continue with DOE under policies promulgated by Public Laws 93-577, 94-163, and 95-580. We are convinced it is the way to continue. The energy factor is at the heart of the entire program.

In the past when our country has found itself in difficult circumstances, it has called on the engineer and the scientist for help. Do you remember the Manhattan program of the 1940s and the space program of the 1960s? Now we have the environmental and energy crises of the 1980s. Once again the government looks to us for help, and again that help is on the way, but don't cut it short when success is abounding. We recognize that budgets must be pared, but there are programs having high benefit-to-cost ratios which promise immediate returns on investment. Why waste the previous investments which have been made? I believe a respectable amount of financial support should continue. I specifically recommend a continuation of the many good programs exemplied by those in the Alternative Materials Utilization Branch of the Office of Industrial Programs. Thank you.

Respectfully submitted by
Edgar G Cadwallader
Edgar [illegible]. Cadwallader, PE LI[illegible]ON Representative
4406 Mahan Rd
Silver Spring, Md 20906

**National-Standard**

**Corporate Headquarters**

July 6, 1981

Mr. George Daniello
D.O.E. Office of Industrial Programs
Forrestal Building - Room 2H-085
1000 Independence Avenue S.W.
Washington, D.C. 02585

Re: N-S Co./D.O.E. Cooperative Agreement
No. DE-F007-801D12163

Dear Mr. Daniello:

In accordance with your request we wish to respond to several questions that were raised with respect to the above referenced project.

Initially we believe it should be pointed out that the D.O.E. solicited contract proposals inviting the private sector to enter into a cooperative agreement with the Department to develop a technology of waste tires into an energy by-product. National-Standard Company responded to such solicitation for two reasons: One, because we felt that we had as much expertise in this area as any other possible submitter and secondly, that the amount of money already expended on waste tire disposal prohibited further capital outlay without third party participation. Additionally, the support and assistance of the D.O.E. was key in our determination to submit our proposal.

While it is our belief that the system will result in a new product line which will benefit the Company and the economy, the prospect of failure is present in this research and development effort as well as in the greater majority of other programs dealing with new products or services. In view of our past experience in this area, further research and development work by the Company without the Department of Energy funding would be unwarranted in view of the risk involved.

We are continuing in our efforts toward realization of a successful project and we look forward to the Department of Energy's continued support and assistance.

Very truly youss,

G. H. Frieling, Jr.
President and
Chief Executive Officer

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BEST AVAILABLE COPY

Thermo Electron
CORPORATION

Energy Systems Division

101 First Avenue
P.O. Box 459
Waltham, Massachusetts 02254
(617) 890-8700

Telex: 92-3411
Cable: TEECORP

January 11, 1982

Mr. John Eustis
Chief, Waste Energy Utilization
  and Cogeneration Branch
Industrial Programs
U. S. Department of Energy
Forrestal Building
Room 2H085
1000 Independence Avenue, SW
Washington, DC  20585

Dear John:

During the past six years, Thermo Electron, Sulzer Brothers Limited and Union Process have experimentally investigated the use of coal-based fuels in modern slow-speed two-stroke diesel engines. These investigations have been supported by DOE (approximately $450,000) and by the direct expenditure of about $1,000,000 by the industrial team members.

The results of the investigations established that coal/water slurry is the most economically promising coal-based fuel for use in these engines. Subsequent tests, funded entirely by the team members, confirmed that the use of coal/water slurries is technically feasible if ash related wear can be reduced.

The coal slurry tests identified several system modifications necessary for long-term reliable engine operation. Improvements are required in fuel preparation, fuel injection, and piston ring lubrication. The development costs associated with these modifications are significantly greater than the combined funds expended to date and substantially greater than the funds that the team members can realistically invest in the near future in this relatively high risk/high payoff technology.

The potential oil savings which would result from the use of coal slurry-fueled diesel engines, therefore, depend on the availability of government support to stimulate and contribute to the initial development efforts. With support, (at least in the early years) as indicated in Proposal Number TE 2810-100, dated May, 1980, Thermo Electron is confident that the development of the coal slurry fueled diesel engine can be expeditiously and successfully completed. Such a development would not be undertaken by industry alone without this initial financial support.

Very truly yours,

Jerry P. Davis
President & General Manager
Energy Systems Division

JD:jmc

# Westinghouse Electric Corporation
statement before the
Subcommittee on Energy Development and Applications
of the
Committee on Science and Technology
by
Dr. George F. Mechlin
Vice President - Research and Development
Washington, D.C.
July 15, 1981

## Westinghouse Electric Corporation Statement
### Dr. George F. Mechlin, Vice-President - Research and Development

Mr. Chairman, and members of the Subcommittee on Energy Development and Applications, good morning. I am George Mechlin, Vice-President for Research and Development of Westinghouse Electric Corporation. I am pleased to have this opportunity to comment on the Administration's proposed energy R&D incentives program, and how it may affect the future of the Nation's energy research and development.

The Administration's intent, as we interpret it, is to maintain a high level energy R&D effort, but to replace Federal budgets with corporate funding. It is hoped that tax incentives, plus high fuel prices, brought about by decontrolling oil and gas, would enable and motivate corporations to replace the reduced government energy R&D funding.

In the opinion of Westinghouse, although higher energy prices and tax incentives might increase our internal funding of such energy R&D, as higher efficiency energy conversion devices, and systems using lower cost fuels, the program would not provide enough incentive for us to match a significant reduction in government funding. Energy R&D economic benefits in large part accrue to our customers, and because they are regulated utilities, more specifically the rate payers through reduced electrical bills. Westinghouse does not obtain enough incremental profits to pay off the R&D and associated product life cycle costs. The net effect would be a substantial reduction in our research activities and the abandonment of many on-going programs.

There is no way Westinghouse can justify large R&D expenditures to replace government funding for such programs as fusion, the breeder, fuel cells, photovoltaics, and improvements in the quality of life.

Many companies would be affected by loss of government funded R&D, and the associated loss of technology leadership by the U.S. would be made more precipitous by foreign government subsidy of energy R&D. Japan has demonstrated its ability to fund meaningful energy R&D for national objectives, from automobiles and electronics to electric trains and steel production. A hiatus in U.S. energy R&D would break up highly productive R&D organizations, and further impair the ability of the U.S. to compete in international energy markets for a long time.

With respect to R&D motivation, tax incentives suffer from uncertainties of definitions and timing. What scientists would agree on the definition of research, or what is energy research? Is a new pilot manufacturing line for a new energy product considered R&D, or is product restyling R&D, and what is synfuel?

Any prudent corporate management spends money for energy R&D knowing, as shown on Chart 1, that it is only a down-payment on a project which, if successful, will require many years, and orders of magnitude greater expenditures for engineering, manufacturing, marketing and capital, before the first dollar of profit.

R&D is a small part of overall product life cycle implementation, but it is an up-front cost. With money borrowed at the prime rate of 20%, at least $33 profit must be guaranteed by the year 2000, to motivate one dollar investment in energy R&D, today. A 30% probability of success for the entire product cycle would reduce today's allowable investment to 30 cents. Such logic must limit private sector energy R&D investment to a few low risk, short term projects.

From Westinghouse perspective, energy R&D funding by the government is preferable, for the following reasons:

o total benefits go to society for any goods provided, from any source, for any purpose; whereas corporate benefits are limited to a specific product, which in turn is limited by competitive partial market capure (example - combustion turbines of all types and sizes for aircraft, electricity, and pipeline applications)

o government funds, from a larger source, at lower interest rates, can cover a larger number of alternatives in high risk energy R&D, for a longer period of time (example - nuclear fission in 1939 to nuclear power in 1957)

o government can fund R&D for perceived good of the country, rather than shorter term economic motives required by corporations (example - photovoltaics use a renewable energy resource, but will not be economic for many years)

Making a transition from generalities to a specific example, Chart 2 illustrates a superconducting generator product life cycle. First - basic research on superconducting material started at Westinghouse in 1948 and evolved into the first practical superconductor, niobium titanium in the 1960's, second - a 5 MW superconducting generator (SCG) was funded by Westinghouse in 1971, third - a Westinghouse - Electric Power Research Institute funded 300 MW SCG is scheduled on line in 1986, fourth - a SCG commercial market of 30 GW cumulative by the year 2000 is forecast.

Capitalized benefits to U.S. utilities by the year 2000 are forecast at $1.3 billion ($200 million, present worthed at 15%), plus energy savings equivalent to 10 million barrels of oil.

If Westinghouse sells half of the SCGs installed to the year 2000, and if its SCG manufacturing costs follow an 80% learning curve, then Westinghouse SCG cash flow, discounted at 15% to today, will break even in 1995, and be $35 million positive by the year 2000, as contrasted to six times as much benefit enjoyed by the utilities.

This example illustrates my earlier statement that the benefits of our energy R&D go in large part to our customer the utilities, and hence to society, through the electricity rate payer.

In retrospect, a dollar of basic cryogenic research performed in 1948, with interest at 15%, would require $100 profit today for payback. Although Westinghouse provided the funding, it would have been an appropriate government expenditure. The superconducting materials, developed by Westinghouse, as well as fracture mechanics data at cryogenic temperatures, are being used for superconducting generators, plus large superconducting coils being supplied to the U.S. fusion program, by Westinghouse and others.

For contrast, Chart 3 illustrates another example, which is a market forecast, and discounted cash flow, for a development that, based on optimistic assumptions, was considered beneficial to utilities, but too marginal for R&D funding and implementation by Westinghouse.

Development of ceramic turbine blades was estimated in 1975 to require $80 million in R&D from 1975-1982 with an expected profit of $205 million, at best, by 1990. This was too far in the future to amortize R&D costs, and as indicated on Chart 3, cumulative discounted cash flow at 15% was a negative $14.7 million by 1990. The calculated rate of return was only 11%, which was too low for a prudent investment in such a risky venture, with such optimistic assumptions.

The $205 million profit assumed complete utility acceptance of ceramic blades in all combustion turbines by 1990, 8% utility generation additions per year, and fuel available for ceramic turbines. Because all of these assumptions were too optimistic, risk for the investment was high.

Society would benefit by obtaining electricity for 15% less fuel energy, because the efficiency of a combined cycle system can be increased from 42% to 49% by the higher operating temperature achievable with the ceramic turbine blades.

For each $2 million profit that a manufacturer can expect from the sale of 1000 megawatts of ceramic turbines (a return realized only once), the savings in energy and capital investment, realized in generating electricity, are approximately $16 million yearly, over the lifetime of the equipment. Based on 1973 prices, the cumulative savings in electricity production by the utilities, was 30 times the profit that can be expected by the manufacturer. Hence, it was concluded the manufacturer should not sponsor the development, but it should be funded by utilities or the government because it was high risk, and most of the benefits went to the utilities. Other than study contracts, no additional action has been taken.

One stated focus of these hearings is, whether the decontrol of crude oil prices, and energy prices which reflect their true replacement cost, will motivate energy R&D, to replace those projects formerly fundable by the Federal budget.

From a Westinghouse perspective, companies which supply coal, oil, gas, or uranium will profit from increased fuel prices, shown on Chart 4, and, with excess profits considerations, will be enabled and motivated to fund additional energy R&D for finding, extracting and processing their products, but not all companies, nor all useful energy R&D, will benefit.

As I stated earlier, Westinghouse sees higher fuel prices as motivation for higher efficiency energy conversion equipment, such as the superconducting generator, but I also pointed out that benefits are mainly obtained by the utility or its customers.

Value added by energy research accrues mainly to the utilities and customers, rather than to the manufacturer of highly capital intensive products, because price realization is traditionally determined more by costs, incurred during years of manufacture than by incremental improvements from R&D. Westinghouse benefits from increased sales.

Relative prices for fuel, motivate energy R&D. Chart 4 provides a contrast between oil and nuclear fuel costs, which confirms the benefit of nuclear energy R&D to date, and continues to motivate Westinghouse to fund nuclear energy R&D for pressurized water reactors, despite a zero market for nuclear steam supply systems in the U.S.

In contrast, it is essential for our nation's energy future, that adequate Federal funds be used to develop and demonstrate the breeder reactor. Any application of energy R&D criteria, yield superlative recommendations for its development:

o more energy available from otherwise useless depleted uranium already mined and processed, than from all mid-east oil;

o a cost to benefits ratio of $3 billion cost for Clinch River, versus a potential energy benefit much greater than two weeks of imported oil, which also costs $3 billion.

o a hundred times as much energy from the world's finite supply of fissile material.

Despite all these fabulous benefits, the total cost and time for breeder development involves numbers too large for the private sector, so that Federal funding is required. Similar logic applies to fusion R&D, with much larger numbers involved.

Chart 4 also illustrates motivation for energy R&D to convert coal to liquid and gaseous fuels. Westinghouse cost-shared with Federal funds the development, construction, and test operation of an advanced, 15 ton per day, coal gasifier, which has produced both low and medium BTU gases. This process development unit would not have been constructed without Federal funds, despite fuel price motivation.

In summary Westinghouse believes that

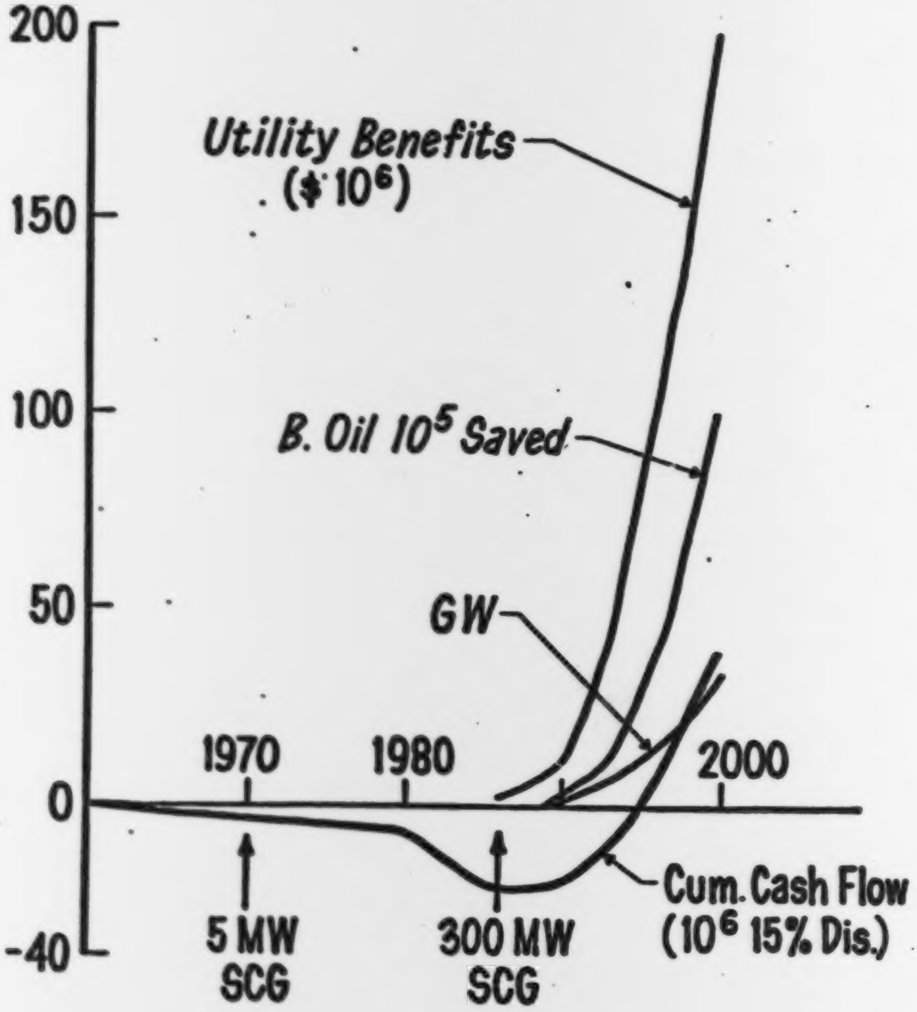
o Adequate energy R&D is vital for the U.S. future. Three examples of necessary objectives which must be both appropriate and economic are: secure fuel supplies, reliable power availability, and an acceptable environment.

o Energy R&D is only a small part of product development cycle costs. Corporate funds can be spent more productively if Federal funds are available for high risk, long lead time energy R&D up-front to optimize product selection and benefit to society.

o High energy prices and tax benefits motivate, and enable, some specific energy R&D, for some types of companies, but for many important energy R&D projects, Federal funds are required.

o Many energy R&D programs of significant benefit to utilities and society - for reasons of mandatory compliance with tightened EPA regulations, national energy security, or quality of life; cannot be funded by corporations, because of inability to return the entire product development cycle cost. We urge the Subcommittee to consider the national benefits of these programs, and therefore recognize them as proper and meritorious recipients of Federal funds.

# SUPERCONDUCTING GENERATOR



ARIZONA STATE
UNIVERSITY TEMPE, ARIZONA 85281

COLLEGE OF ENGINEERING AND APPLIED SCIENCES
DEPARTMENT OF CHEMICAL AND BIO ENGINEERING (602) 965-3313

February 4, 1982

Bruce Cranford, Jr.
Program Manager
Office of Industrial Programs
CS-40, U. S. Dept. of Energy
Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Bruce:

I offer the following comments concerning our project, CONVERSION OF CELLULOSIC WASTES TO LIQUID HYDROCARBON FUELS (DOE Contract No. AC02-76CS40202).

1. Cellulosic wastes are a viable source material for contributing to the minimization of waste disposal problems with accompanying generation of fuels and chemical feedstocks.

2. A thermochemical conversion approach is utilized (as opposed to biological routes such as anaerobic digestion or hydrolysis - fermentation). The major advantages are low processing times and the capability to accept multiple feedstocks without significantly altering processing conditions.

3. An indirect liquefaction approach is utilized on the project (gasification followed by liquefaction). This approach offers the major virtue of successful isolation of the oxygenated compounds produced from cellulosic wastes from the hydrocarbon products. Thus if one is interested in producing a high quality transportation fuel such as diesel, jet or gasoline, equivalent to that currently derived from petroleum (and thus compatible with current engine designs and the fuel distribution system), an indirect liquefaction approach appears to be the obvious option.

4. The product emphasis on the project has been a paraffinic transportation fuel equivalent to No. 2 diesel and jet fuels (e.g., kerosene, JP-4, JP-5). Conversion to a high octane gasoline is also possible via existing catalytic reformer technology. However diesel and jet fuel demand is expected to increase enormously in the next twenty years. Thus, quoting Dr. Edward David, Jr. (President of Exxon Research and Engineering Co.), ". . . The result is a historic shift in the pattern of demand for liquid fuels: whereas the nation now consumes about three times more gasoline than jet and diesel fuels, it could be consuming about equal portions by the year 2000." (IGT Gascope, Autumn 1981).

5. Modification of the liquefaction step (catalyst type and operating conditions) offers the possibility of producing alternate products appropriate for market conditions at different locations.

6. Process simplification studies offer the eventual possibility of a portable system that could be moved to alternative feedstock sites.

7. The project is generally recognized as being at the forefront in research to convert biomass type materials to liquid fuels (citations available on request).

8. A large number of students are employed on the project (~20 at present). Thus individuals with advanced training for careers in energy related fields are constantly emerging from the project.

9. The concept of producing high quality liquid fuels from various cellulosic type feedstocks has been demonstrated on the project. The goals of maximizing product yields, production of alternative products, simplification of the process, further testing of alternative feedstocks and scaleup to a larger facility have not yet been achieved. Thus most items on the current and projected work statements fall into the category of high risk, long term research with economic payoff too far off to attract substantial private industry funds at this time.

10. In time of economic downturn (such as presently exists), private industry inevitably cuts the longer term payout projects in which they are involved. Thus a project of this nature dependent on substantial industrial funding (either in-house or external contract) would be subject to large discontinuities with economic cycle fluctuations. This can lead to chaos with regard to rational process research and development.

11. Public domain funding serves a checks and balances role with private industry. Thus, for example, an international oil company might have the incentive to continue with feedstocks of declining availability with shortfalls compensated by increasing prices. Development of alternative supplies and dissemination of information to the public sector thus encourages private industry to address options of long term benefit to the American consumer.

12. An optimal funding approach is to initiate a long term payoff project with public funds and entice industry to participate via dissemination of positive results with the eventual goal of commercial application with total private funding. This project is following this course.

I hope my comments will be of some use. Please let me know if you would like further elaboration.

Yours truly,

James L. Kuester
Principal Investigator
Professor of Engineering

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**Republicsteel**

Republic Steel Corporation
Research Center
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PO Box 7806
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February 5, 1982

Mr. J. C. Fulton
Department of Energy
Forrestal Building
CE 121.3, Room 6G090
1000 Independence Avenue
Washington, D.C. 20585

Dear Mr. Fulton:

Republic Steel Corporation has supported the Purdue Laboratory for Applied Industrial Control (PLAIC) at Purdue University since 1974. Sponsorship has been maintained because of the valuable input which the Corporation is receiving from the Laboratory's meetings and reports in the area of modern process control. Information has proved quite useful in areas of process modelling, process scheduling, and network design, all within the general framework of modern hierarchical control systems.

In order to be competitive in the world, it will be essential that the American steel industry implement hierarchical control systems as a fundamental part of their technological innovation. I believe that this principle applies to the process industries in general. The PLAIC studies give the advantage of providing new, modern control system designs together with evaluations of the relative effectiveness of alternatives. This fresh, new "state-of-the-art" input is very useful for the design and implementation of control systems either for new plants, or for retrofit systems in existing plants. There is a high likelihood of the incorporation of these ideas and designs into useful systems in the steel industry. Naturally applications of these developments will differ from company to company because each company has its own unique state of systems development. In my opinion there is a high likelihood of incorporation of these projects into systems development in many process industries.

At Republic Steel we are at present installing a new "state-of-the-art" soaking pit control system based on PLAIC model development plus other concepts. This high return project will be extended to other plants once the initial "proof-of-concept" demonstration is made. This system will involve not only heating control but also higher level systems involving information transfer and scheduling. Energy savings have already been achieved with a crude manual implementation of PLAIC results.

The existence of the Purdue work has been an advantage not only for Republic but for other companies in the industry who are also known to be involved in soaking pit projects. It should be noted that new work is underway at PLAIC which gives promise of even greater utility for soaking pit control. This is only one example of payback from PLAIC sponsorship. Other examples could be cited, and other steel company sponsors have similar examples, I am sure.

People with specialized education and experience are required to accomplish this high technology work. Such knowledgeable people are sought in a highly competitive market. Process industries compete with manufacturing, communication, and aerospace and defense industries for people with these skills. PLAIC projects provide welcome opportunities for research into long-range optimal designs. The PLAIC studies have the advantage of being generic in the sense that they are not specific to any company and thus are a general source of systems design information which can be applied in various company environments. Since it would be very costly and time-consuming for each company to perform its own research and development in this area (to say nothing of the difficulty of acquiring skilled people), government support for the PLAIC project would provide a most useful application of government resources. With the scarcity of skilled personnel, companies are hard pressed to maintain competent staffs for short-range, immediate applications let alone long-range development.

A further advantage of the PLAIC project to the sponsors is the existence of the Steel Industry Advisory Committee. This committee helps maintain focus on real-world questions. The likelihood of utilization of these studies is much higher with the input of the Advisory Committee than would originate from an academic abstract approach.

I very much appreciate the opportunity to comment on PLAIC. It is hoped that the Department of Energy will agree that the program has much merit and that PLAIC projects will be supported in a tangible fashion.

Very truly yours,

Donald S. Leckie

Donald S. Leckie
Assistant Director of Research

DSL/aw

cc: Professor T. J. Williams
Dr. N. A. Robins

Inland Steel Company
Research Laboratories
3001 East Columbus Drive
East Chicago, Indiana 46312

219 392 5820

Norman A. Robins
Vice President
Research

**Inland Steel**

February 3, 1982

Mr. J. C. Fulton
Department of Energy
Forrestal Bldg.-CE 121.3, Room 6G090
1000 Independence Avenue
Washington, DC 20585

Dear Jim:

I am writing to inform you that the Inland Steel Company fully supports the proposal being submitted to the Department of Energy by the Purdue Laboratory for Applied Industrial Control (PLAIC) for continued funding of the project entitled "Hierarchy Control for Energy Savings in the Steel Industry."

As you know, this project is being conducted by PLAIC with the full cooperation and support of several major steel companies, including Inland Steel, and equipment suppliers. This cooperation insures that the work done is relevant, and that, when appropriate, results are implemented as they become available. It is significant to note that several of the developed technologies have already been implemented by individual steel companies, when such undertakings proved to be cost-effective for their particular facilities and needs.

With regard to hierarchy control, there is a continuing need to develop technology to retrofit existing U.S. steel plants with hierarchy control systems. However, the cost of such research and development work is sufficiently large, and the benefits are sufficiently diffuse, that it is unlikely that individual companies would undertake such an effort on their own. Even though the cost justification of a hierarchy control system for a U.S. steel mill is a complicated and uncertain undertaking, it is generally accepted that the application of such a system will result in increased productivity, improved yield, and decreased energy consumption. The Japanese have designed and built greenfield steel plants to incorporate hierarchy control concepts; and those plants have demonstrated that hierarchy control is not only technologically feasible, but also economically justified, especially in terms of major energy savings.

The current PLAIC project is the only program we know that would develop the necessary technology required by the domestic steel companies to implement hierarchy control concepts and systems on their existing facilities. Based on PLAIC's past performance and qualifications, Inland strongly recommends that the PLAIC proposal be approved for continued funding by the Department of Energy. The success of this program would result in more efficient operation of the domestic steel plants, and ultimately in significant energy savings in the steel industry. In addition, the program produces much needed technically trained engineers for the steel industry.

Your favorable and timely consideration of the PLAIC proposal will be much appreciated. If I can be of further help to answer any questions you may have on the subject, please do not hesitate to call.

Very truly yours,

Norman A. Robins

NAR/sgr

**LI·CON, Inc. (LIQUID CONDITIONERS)**

P. O. BOX 10717 • PENSACOLA, FLORIDA 32504 • TEL. 904/477-0334

June 25, 1981

Dr. Jerome F. Collins
U.S. Dept. of Energy M/S2H085
CS40, Forrestal Building
Washington, D.C. 20585

Dear Dr. Collins,

With reference to our telephone conversation yesterday, I appreciate the opportunity to express my thoughts as to the importance of the role of the Federal Government in providing financial assistance for Research & Development projects. There are many reasons why this is necessary if our country is to maintain its leadership in innovative ideas. I would like to enumerate a few that come to mind as President and Chief Engineer of a small business.

1) In these days of high interest rates it is almost impossible to attract venture capital for high risk R&D projects. If you do, it usually involves turning over control of the business to someone only interested in a quick profit. The engineering control then suffers alarmingly to a point where the project, no matter how good, can be doomed to failure.

2) For a considerable number of years, I worked in R&D for AMF Inc. When the founder, Morehead Patterson was alive, innovative ideas were encouraged and nurtured. Now, the typical conglomerate will usually only entertain ideas germain to their business units. They prefer to let entrepreneurs take the risks and then try to buy them out if they generate a highly profitable marketable item.

3) The small businessman today has to rely on the Federal Government to have a staff of engineers who can evaluate his proposal and where warranted have it funded, and brought to fuition. This, in my opinion, is the only way we can reduce new ideas to practice and benefit mankind.

4) In today's marketplace the risk of failure is disasterous and many good ideas are being stifled. Even a small failure can lead to premature bankruptcy in these troubled times.

5) Simply getting someone to try something new is extremely difficult. The Federal Government has to be the guinea pig in many instances, but the people in the long run

benefit from spin-offs as evidenced by LI-CON's existing contract.

6) The small businessman is, was and shall continue to be the backbone of America, but the only way he can stand on his own against ever enlarging conglomerates is with Federal assistance in such areas as R&D.

Let me say simply in closing, that without the Federal Government's assistance in LI-CON's R&D ventures, I would wile away my time in an easy chair collecting Social Security.

Yours very truly,

LI-CON, INC.

W.R. Williamson

W. R. Williamson, P.E.
President

WRW:emw

ARMCO INC.
GENERAL OFFICES • MIDDLETOWN, OHIO 45043

RESEARCH & TECHNOLOGY
L. C. LONG
DIRECTOR,
PROCESS RESEARCH

February 3, 1982

Mr. James Fulton
Department of Energy
Forrestal Building - CE 121.3
Room 6G090
1000 Independence Avenue
Washington, DC 20585

Dear Jim:

Dr. Norman Robins has indicated to me that we are once more in a time when an expression of support for the PLAIC work is timely.

As you well know, I have been critical of some aspects of that work. I think that an honest poll of all the steel industry advisory members would show that each of us is critical of some particular aspect of it, because each of us has different needs--different areas where we have progressed on our own. Nonetheless, I believe that the work done at Purdue, overall, will be of value to not only the steel industry, but to other large manufacturing industries in this country.

I do not mean to imply that we are likely to get finished packages out of this project. This has never been my personal expectation or experience. Nonetheless, out of this project as a whole have come valuable developments which have allowed us to go forward on our own and to develop significant applications in our plants. The most outstanding example of this, of course, is our ingot processing system.

The key to the success of our ingot processing system is unquestionably our ingot thermal model which uses easily observed and recorded input data and can predict with demonstrated accuracy the thermal state of an ingot at any stage in its career from teeming to rolling.

Now our ingot processing system is far more complex than that and involves many logistic controls. Nonetheless, it is the model which is the key to its success and although that model is an Armco development, it evolved from work that we originally supported and cooperated with in the original steel industry project.

Our overall energy saving from the IP systems has been quite significant in direct conservation and we now are beginning to compound that by truly innovative methods made possible by our ability to predict and control.

In addition to ingot processing, we have taken the output of other parts of this study and applied them either to specific jobs in the plant or to our own needs for study of our processes and material flow.

At the present time, our blast furnace engineers are working very closely with the Purdue project and to bring along the blast furnace model that is being produced there. We anticipate that, again, this work will provide a starting point for us to go on to our own blast furnace simulation, and ultimately, on-line control model. We do not anticipate that we will be able to directly use the product of the Purdue program.

In all, we see this program as producing the valuable, fundamental work which is the function of a university. At the same time, it provides a dialogue between the university and industrial worlds, provides insight into each other's problems, and is a source of competent workers for industry.

We believe, even in this era of reduced federal spending, that this project is worthy of support.

Sincerely,

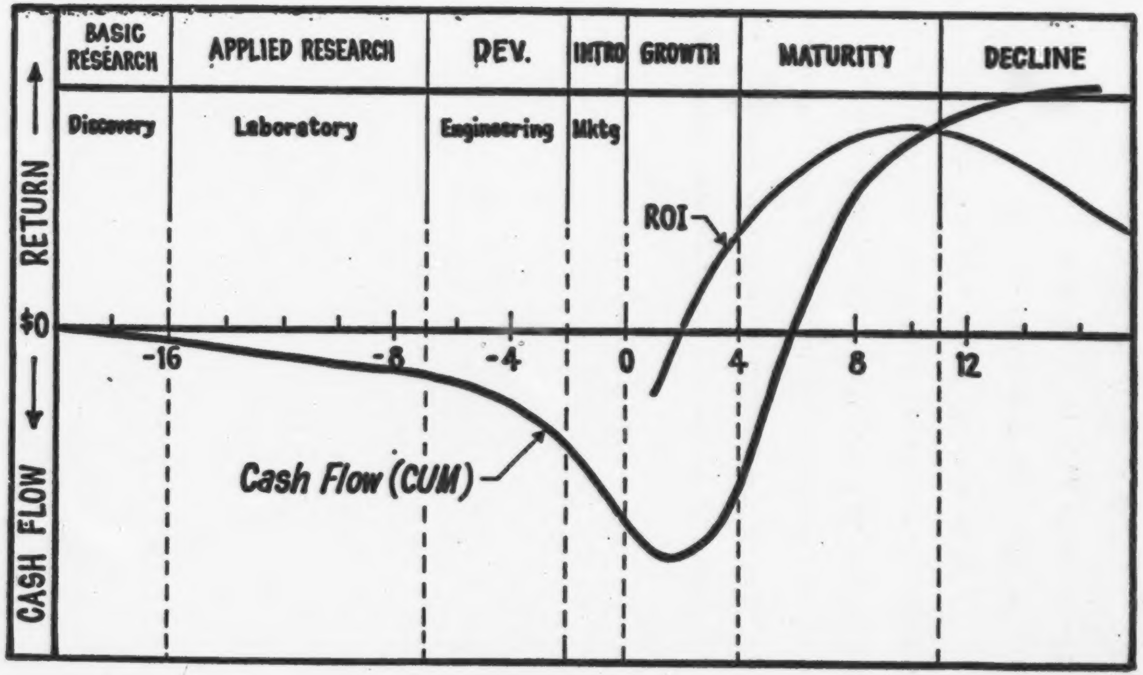
Corporate Director
Process Research

LCL:slm

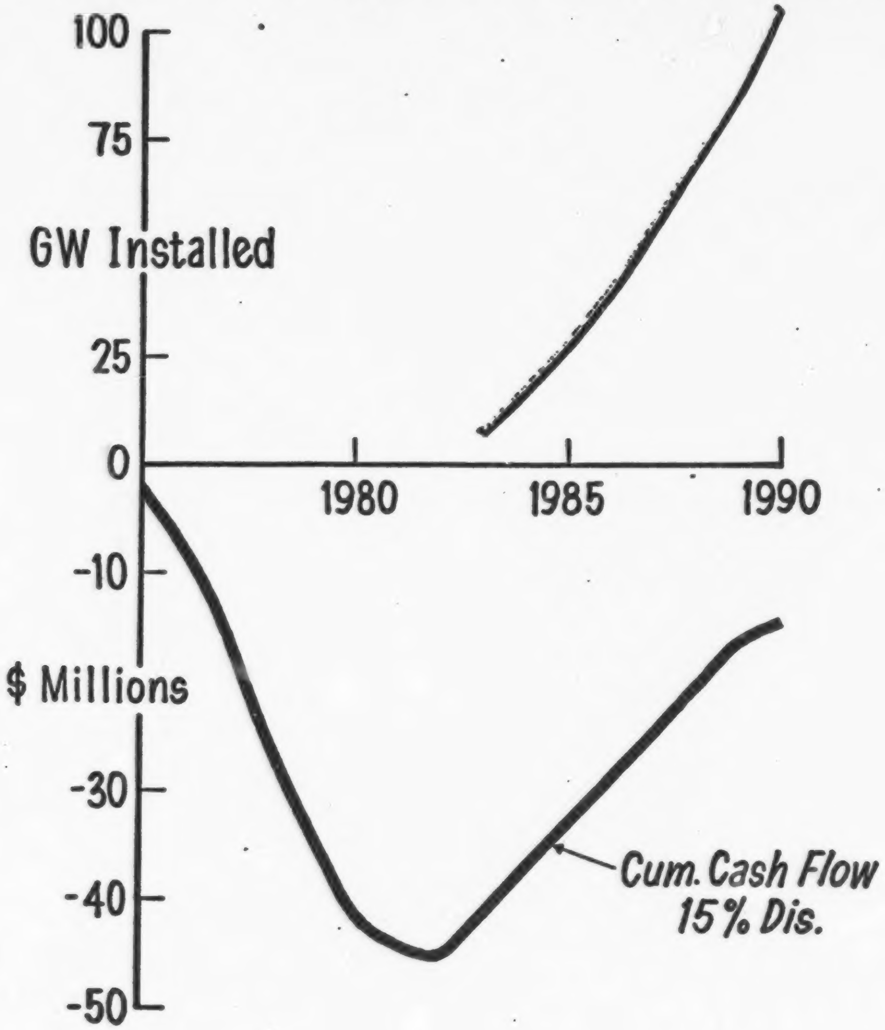
cc: N. A. Robins
T. J. Williams

104

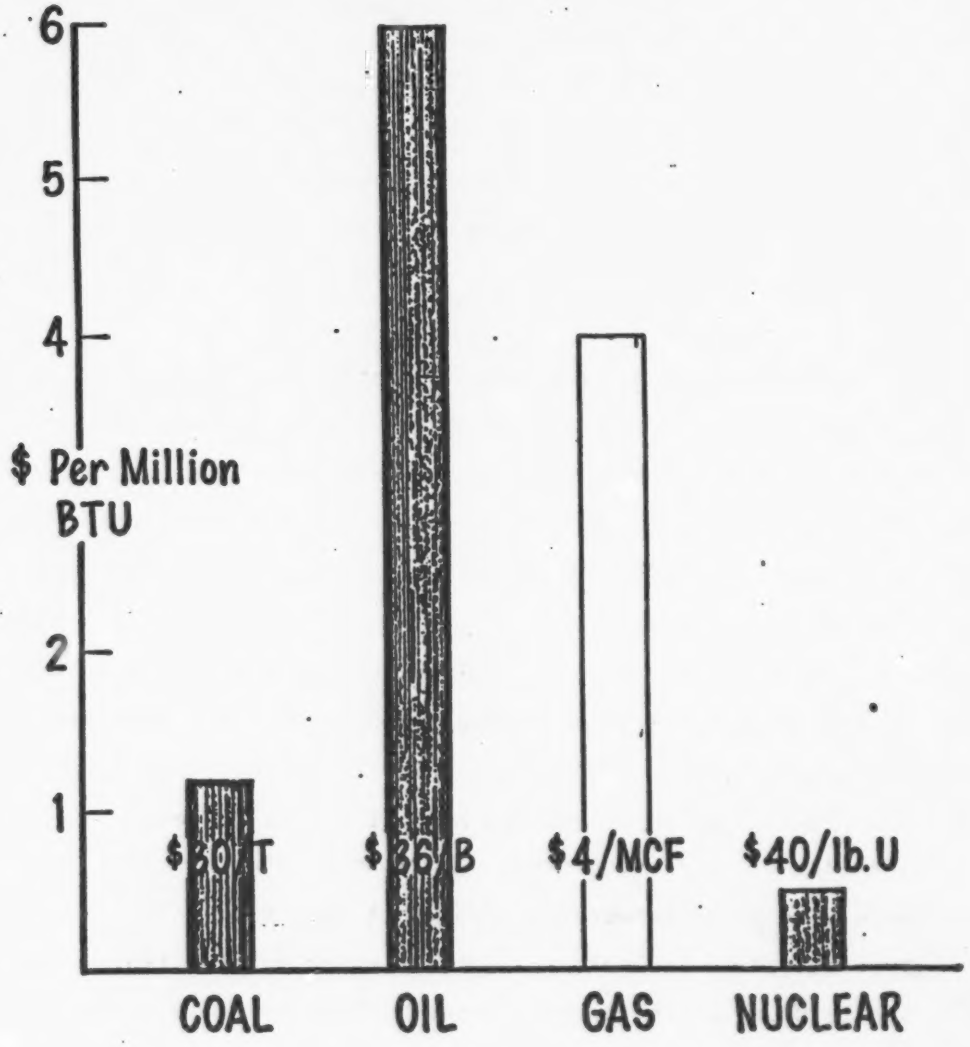
# PRODUCT LIFE CYCLE



# CERAMIC TURBINE BLADE DEVELOPMENT



# FUEL COST


6
5
4
2
1
$ Per Million BTU
$30/T
$36/B
$4/MCF
$40/lb.U
COAL
OIL
GAS
NUCLEAR

ASME Winter Annual Meeting
November 20, 1981
Washington, DC
Advanced Energy Systems

# THERMIONIC ENERGY CONVERSION

Fred Huffman

Thermo Electron Corporation

Waltham, Massachusetts

I accuse the present administration of throwing out "technological babies" with ideological bathwater. Unless someone with sufficient technical stature can be found to convince the President that some of his energy policies are extremely shortsighted, then this country will dissipate important technical investments.

It is ironic that an administration ostensively committed to business recovery is scuttling the nation's R&D base when whatever industrial advantage this country may have is generally conceded to be its technical expertise. If the government thinks that the new tax incentives, desirable as they are, will motivate more than token industrial support of TEC, MHD, and thermoelectric technologies (all of which are far from commercial application) in the present economic climate of 10 percent inflation and 20 percent interest rates, then (with apologies to Mr. Pickwick) "the government is an ass."

ST REGIS TECHNICAL CENTER, WEST NYACK, N.Y. 10994

ROBERT L. MYERS
Vice President
Technology

January 22, 1982

Mr. Al Streb
Director, Office of Industrial Programs
M. S. 6G030
U. S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D. C. 20585

Dear Mr. Streb:

St. Regis has had the opportunity and privilege to work with the Office of Industrial Programs on two cost sharing projects directed towards energy conservation in the pulp and paper industry. In each case, St. Regis' senior management saw the need to solicit and accept proportional government support for these R&D efforts.

Both Hydropyrolysis and computer control are technologies in which St. Regis invested considerable R&D funds leading to the development of new approaches to energy conservation. Hydropyrolysis is a new process while computer control would be a new approach applied to existing processes. In both instances the next step in moving these technologies towards full scale utilization required the expenditure of considerable capital monies and R&D funds and carried a high risk, which combined to preclude further work by a single company.

Considering the importance of energy conservation to the national interest, the impact of these technologies, if successful, on national energy consumption and the high risk involved, St. Regis believes it to be prudent for the Federal Government to support these and similar activities.

Furthermore, we will seek continued support by the DOE for the program on energy conservation through computer control. A major portion of this program has the additional advantage of transferability to other industries. We expect, at the end of Phase I, to provide basic insights into methods for simulating a continuous process manufacturing plant in a computer with the capability to track unit process efficiencies on a day-to-day basis. This technology will provide the means to schedule plant operations in real-time to reduce energy consumption while at the same time meeting production goals.

The potential significance of this work was well documented in our original proposal and I will not repeat it here, except to remark that it appears to me to represent the ideal combination of accomplishing very high energy savings with a shared risk project. The benefits at a single mill such as Monticello alone would justify the project but I am certain that if it is as successful as we anticipate the technology will be adopted very quickly by the entire kraft paper industry representing at least 100 mills in the United States.

We have appreciated the opportunity to work with DOE and hope that we will be able to continue into the next demonstration phases.

Sincerely,

Robert L. Myers
Vice President
Technology

RLM:bls

cc: T. Gross; Ernest Loeb; John Rossmeissl; S. Sobczynski

FLORIDA COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF FLORIDA
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES

COOPERATIVE EXTENSION SERVICE
SCHOOL OF FOREST RESOURCES AND CONSERVATION
AGRICULTURAL EXPERIMENT STATIONS
COLLEGE OF AGRICULTURE

REPLY TO: McCarty West
Gainesville, FL 32611

February 15, 1982

Mr. Al Streb, Director
Office of Industrial Programs
Department of Energy
Forrestal Building
Washington, DC 20585

Dear Al:

In a recent telephone conversation with Wanda, she mentioned the need to justify funding related to the Energy Integrated Farm Systems Program. Apparently the question has surfaced regarding whether or not the private sector could or would pick up the support and continue the program without DOE's involvement.

As you know I have had the experience of working with the farm program while on the IPA assignment at DOE in 1977-78. It was clear to me before I took the assignment, and even more clear after working with the farm program, that private industry in the agriculture sector is not capable nor able to carry out research and development in this area.

Except for the large tractor manufacturers such as Deere and Company, International Harvestor, Ford and others, the bulk of the equipment supplied on the farm is from small manufacturers. These small manufacturers and farmer cooperatives are certainly interested in research and development and often participate as best they can given their limited resources and expertise. We often find them cooperating with Land-Grant Universities to carry out research projects.

The traditional manner in which new developments occur in agriculture is generally of the following nature: State and/or federal research funds are provided to the Land-Grant University to develop new technology or practices to eventually be utilized by the farmer. Sometimes both farmers and small agri-business industries cooperate and even provide modest financial support for individual projects. The new developments occur, and the results are published by extension faculty in many non-technical forms such that the farmers can understand and proceed to implement. In the case of new equipment development, such as a new type of vegetable harvester, the design is utilized by a small manufacturer to produce and market the equipment.

The development of the Energy Integrated Farm System program was prompted because there is a genuine future need for farmers to move toward these types of systems. Without the federal funding, these developments would simply not take place. The DOE program staff saw, with input from advisory groups, the need to develop energy integrated farm systems for the future. Participants

(continued)

were invited to prepare proposals to address this research development area. Eight projects were selected that best illustrated farm systems where energy integration was needed and desirable. None of these eight major projects would have been initiated if it were not for the federal assistance.

The projects are all generally now in the crucial development stage, and significant research information will soon be forthcoming. If funding is no longer available to continue these projects, none will ever reach completion. Farmers do not have the capital to risk on experimental systems. They are willing to invest once the concepts have been developed and tested. The small industries with interest in the programs simply do not have the capital to step in and continue the research on the experimental systems.

If the federal money is discontinued at this point, the loss to the public will be substantial and the rather large sum of federal money already spent will essentially be wasted. The federal government not only loses credibility with the agricultural sector but also reduces the confidence for future cooperation. The real benefits from the program will occur in future years. There is a major multiplying effect because the information gathered from the successful projects is quickly and effectively disseminated to farmers throughout the United States through the Cooperative Extension Service.

I can speak more specifically about at least two of the projects. Since I was located at Cornell University when the dairy project was initiated, I know something about the nature of that project. The Cornell project is an excellent example of the cooperation on the part of the University, state government, private industry, a dairy farmer and the federal government. The project would not have been possible without the federal support. If the federal support is taken away the project will likely never be completed. The farmer would be left with a half completed, non-functional system that would never reach its desired potential. There is a real opportunity for great success with this project that could change the future of dairy farming in the United States and move toward energy self-sufficiency on this type farm.

The dairy farmer must depend, at this point, on having the engineering research capability of the university to carry out the project. Without funds this expertise would not be available and the farmer would suffer serious consequences after being willing in the beginning to allow his farm to be used for the development of a complete integrated system.

Another similar project exists at the University of Nebraska. This project has progressed right on schedule and will eventually be an excellent example of an integrated system for a swine and grain farm. Again, if the funding is not available, this project will not be completed as planned. The loss of the information and future development would be most unfortunate. While they have had some help from state funds and private industry, the loss of the federal partner would essentially kill the project.

(continued)

I admit to some bias in this area, but I firmly believe that the results obtained from the Energy Integrated Farm System program could be the most significant energy development related to agriculture in this century. It would be an absolute shame to lose this potential benefit with the investment that has already taken place.

Sincerely,

D R Price
Donald R. Price
Assistant Dean

DRP/ld

cc: Ms. Wanda Porterfield

ARMCO INC.
GENERAL OFFICES • MIDDLETOWN, OHIO 45043

RESEARCH & TECHNOLOGY
ARMCO

January 14, 1982

Dr. Jim Fulton
Dept. of Energy
Forrestal Blvd. C.E. - 121.3
1000 Independence Ave.
Washington, D. C. 20585

Dear Jim:

John d'Entremont recently gave me Dr. Julian Szekely's proposal for additional funding on mathematical modelling of fluid flow and heat transfer in electric arc furnaces. I think Julian and his co-workers started to make some real progress during the last year of DOE funding on the mathematical modelling of the arc and its interaction with the environment, even though it was a single phase system. I am not enough of a physicist or mathematician to really judge his work but some of their conclusions on energy transfer from the arc made good sense. I would like to see this work extended and if Julian doesn't continue it I don't know who will pick it up. I rather doubt that Julian's proposal for multiple sponsorship by steel corporations and suppliers of arc furnaces will acquire enough support to allow him to continue at a funding level of $120,000 - $150,000 per year. In fact, I doubt that I can get Armco to support this work at $15,000 per year on a shared basis. Therefore I am recommending Federal Government funding if it is still possible under the tremendous budget cutting pressure.

Very truly,

Steve Gilby

S. W. Gilby
Manager
Melting and Refining
Armco Inc.
Research and Technology

BFI

**BROWNING-FERRIS INDUSTRIES**

P.O. BOX 3151 • HOUSTON, TEXAS 77001 • 713/870-8100

July 7, 1981

Jerome F. Collins
Chief, Alternative Materials Utilization Branch
Office of Industrial Programs
United States Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Collins:

I am writing to enumerate reasons why Browning-Ferris Industries supports continued federal funding of research and development projects related to waste-to-energy.

As you know we have conducted tests in conjunction with the Gulf Coast Portland Cement Co., burning refuse-derived fuel to supplement natural gas in manufacturing cement. When we conceived the tests and discussed them with the cement industry, it was agreed that, if certain technical problems could be overcome, there were potential benefits.

However, the technical problems posed high risks. Because BFI is a publicly-held, profit-making company, prudent management only takes risks when the potential benefit far exceeds these risks. Funding of the waste-to-energy project by your office removed this potential loss and allowed the research to go forward. Although prior work had been done with company funding, it was on a much smaller scale and even though the results were encouraging, more extensive testing such as that funded by the Department of Energy was strongly indicated.

Browning-Ferris is principally engaged in the collection, processing and ultimate disposal of solid and liquid wastes. More often than not, the ultimate disposal is burial in secure landfills. We are always interested in ways to lessen the amount of land necessary to meet those disposal needs. Less disposal translates to better utilization of landfill space, longer landfill life and less operating costs. Disposing of part of the solid waste stream (up to 70%) by co-firing with conventional fosail fuel results in a smaller quantity to dispose of by landfilling. The financial and environmental benefits of this concept are obvious.

Federal funding of alternative fuels projects like the cement kiln tests serve another valuable purpose. Industry often requires conclusive proof that a new technique or method will lower their operating costs, increase productivity or otherwise benefit their business. This proof is in the form of success of other facilities. Succesful demonstration is aided by your funding. Timing has a part in this acceptance also. In the case of burning refuse-derived fuel, its attractiveness increases as conventional fosail fuels increase in cost and become harder to find. Federal funding allows continued research to perfect and demonstrate technical feasibility so that when it becomes economically attractive, the technical risks have been at least identified and at best solved.

Browning-Ferris believes supplementing conventional fuel with refuse derived fuel in the manufacture of Portland Cement is technically feasible. We encourage federal funding to advance the state of the art to a point where it becomes an accepted method of conserving our natural fuel supply while aiding the task of solid waste disposal.

Cordially,

Bruce Hendrickson
Vice President
BFI

**Westinghouse Electric Corporation**

**Power Generation**

Jack R Barrett
General Manager
Combustion Turbine Systems Division

Box 251
Concordville Pennsylvania 19331

January 5, 1982

U.S. Department of Energy
Office of Conservation & Solar
Energy Industrial Programs
1000 Independence Avenue, SW
Room 6G-056
Washington, D.C. 20585

ATTENTION: Mr. J. Eustis

Dear Mr. Eustis:

Subject: Unsolicited Proposal - "A Coal-Fired Cogeneration Project"

This is in reference to our proposal of July 15, 1981 entitled "Phase Zero - Generic Studies of Advance Fluidized Bed Air Heater Technology." Westinghouse would like to elaborate on the need for Department of Energy participation within this program.

AFB steam generation technology is considered generally to be near commercialization. However, AFB air heater technology is of higher risk and longer term development nature. For AFB air heater technology to become commercial within the utility/industrial sectors, it must be accepted on its technical merit and, even more importantly, on its economic merit.

Technology acceptance by the private sector depends greatly on their need for it and their willingness to accept the associated risk. Advanced coal burning concepts such as the AFB air heater will require a substantial cost of electricity incentive to even be considered. It is our opinion that AFB air heater technology can offer higher efficiency at a lower cost power generation over conventional coal fired steam and AFB steam generation systems.

The statement of work defined within our proposal would assist in evaluating the AFB air heater system and economic option available for consideration by the private sector. At present, the market potential for AFB systems does not justify Corporate expenditures to pursue the proposed program without DOE participation. The role of DOE is clearly applicable during Phase Zero evaluation of the AFB air heater technology concepts and economic feasibility since the development and commercialization will totally be undertaken by the private sector.

Without the DOE participation, I would be reluctant to commit resources to this program. Although we consider the technology to have beneficial long term potential, the technology and market risks are too significant for us to go it alone.

We, therefore, respectfully request that you consider our views on Government participation with our proposal.

Very truly yours,

Jack L. Barrett

United States Steel Corporation

WALDO RALL
DIRECTOR
CONTRACT RESEARCH

RESEARCH LABORATORY
125 JAMISON LANE
MONROEVILLE, PENNSYLVANIA 15146
412/372-1212 OR 351-3100

October 21, 1981

Mr. R. L. Sheneman, Chief
Advanced Extraction, Recuction, and Melting
Office of Industrial Programs
Forrestal Building, CE 121.3
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Sheneman:

Subject: FULL-SCALE PILOT FACILITY FOR DRY COOLING OF COKE - DE FC07-801 D12158

We have reached the 90-percent-of-obligation expenditure point and are preparing the appropriate modification-and-status report for the Idaho Operations Office. The program continues to show promise, but because of the innovative and high-risk concepts that are involved and the unforeseen complications that arose in the design of the pilot facility, we have had to commit more research effort and facility construction funds to the project than anticipated. These are consequences of the same high-risk and nonexclusive-benefit considerations that made us unwilling to fund the program on our own, but encouraged us to seek a cosponsor. The design, construction, heat-transfer, and maintenance problems were all unknowns, but the potential benefits of energy conservation and reduced environmental emissions appeared to justify the undertaking.

It would appear at this time that there will be at least an additional $100,000 required for the construction and installation of the pilot facility and another $150,000 required to carry out the balance of the testing, evaluation, and reporting program. We are currently detailing and substantiating the increases. We trust that your evaluation of the project and commitment to it agrees with ours and that you will continue to share in the cooperative program.

Very truly yours,

Waldo Rall

WR/teb

DEPARTMENT OF STATE

Washington, D.C. 20520

BUREAU OF OCEANS AND INTERNATIONAL
ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

November 13, 1981

Dr. Alan M. Wolsky
Special Projects Group
Energy and Environmental Systems Division
Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439

Dear Dr. Wolsky:

At my request, Martha Strong of the Office of International Energy Programs has forwarded to me several documents in the Argonne series of energy use in various industries. I greatly appreciate your providing these documents to Ms. Strong for the State Department's use. Our Office of Caribbean Affairs has provided them to the Government of Suriname to determine an industrial development strategy consistent with Suriname's energy supply options.

The documents have been extremely useful in these discussions, and we are grateful that you were able to provide them.

Sincerely,

Jean Christoff

Jean Christoff
International Relations Officer
Office of Energy Technology
Cooperation

Peabody Gordon-Piatt, Inc
PO Box 650 | Winfield, Kansas 67156 | Telephone 316 221-4770 | Telex 417-452

The Honorable Robert Dole
U.S.Senate - Dirksen Bldg.
1st & C Streets NE
Washington, D.C. 20510

SUBJECT: D.O.E. PROJECT DE-AC03-78-ET-13148, "DIRECT COMBUSTION OF INDUSTRIAL DRY COMPOSITE WASTE IN SUSPENSION".

Peabody Gordon-Piatt

28 April, 1981

Dear Senator Dole:

Mr. Frank DeGeorge, Acting Assistant Secretary for Conservation and Renewable Energy, U.S. Department of Energy is currently going through a rigorous review of a number of individual projects requesting D.O.E. funding for FY82. His difficult task is to determine the contribution each project can be expected to make in saving fuel oil, or gas, and that without Government support, industry will not proceed with the specific development in the near term. Ours is one of the projects undergoing scrutiny.

We are requesting support for the previously planned next step subsequent to a successful two year, full scale, R & D project, not a new project. This project has identified large classifications (S.I.C. Groups) of industrial organizations that generate composite waste, dispose of it, and use oil or gas to generate steam. We have completed the R & D necessary to retrofit existing boilers with suspension burners that use this waste for fuel, thereby replacing an equivalent quantity of the conventional fuel.

If, for example, only 4,200 of 42,102 plants in Standard Industrial Code (SIC) 27, Printing, Publishing, and Allied Products, supplied only 1/3 of their steam needs by using composite waste for fuel in a retrofit burner installation, more than 49 million barrels of oil per year could be saved.

Although calculations show a payback in less than 3 years, good judgment prevents these plants from engaging in a retrofit program until it has been proven to their satisfaction that the risk is acceptable. Unlike wood waste that is homogeneous, composite waste has wide and random variations in heating value, ash content, moisture content, and most importantly, combustion air requirements. We have learned how to cope with these variations while generating steam on demand, but the duration of test burns in our R & D project has not exceeded three days.

We have spent two years and nearly $710,000, of which $155,000 was our own, to get where we are. Without the next step, as proposed in the contract modification, this expenditure could well be wasted; our small company cannot support the cost.

The amount of $428,000 requested is to cover the cost of selecting a host, designing and installing the retrofit system and monitoring it for one year of full operation. The equipment costs are to be bourne by the Host plant.

We sincerely believe that the benefits of the project modification warrant the funding requested; we hope that Mr. DeGeorge will agree.

Sincerely,

MK Gordon

M. K. Gordon, President

MKG/mr

Manville Corporation
Ken-Caryl Ranch
Denver, Colorado 80217
303 978-2000

Manville

November 16, 1981

Mr. Jerome Collins
US Department of Energy
Office of Industrial Energy Conservation Programs
Forrestal Building
Washington, DC 20585

Dear Jerry:

When we discussed our unsolicited proposal "Recovery and Reuse of Asphalt Roofing Waste", you asked me to provide you with some additional background information regarding the possibility of industry doing the study without DoE support. You also wanted some indication whether the Asphalt Roofing Manufacturers Association (ARMA) would help in disseminating the information from the study.

Let's take the second item first. I have talked with Richard D. Snyder, the Executive Vice President of ARMA and he has indicated that his organization would be very pleased to distribute results of the study to the members. Since this organization has as members most of the asphalt roofing manufacturers in the country and have many active committees, this will provide DoE an excellent means of letting the industry know about the progress and results of the study. Both written reports and verbal presentations could be made.

The other question you asked is why a company such as Manville would not undertake the study on its own. The following four reasons indicate the problem of industry doing this study:

1. The research is long-range by industry strandards and very little long-range research has historically been done by this industry. Commodity business such as asphalt roofing cannot support long-range research.

2. The cost to complete this project is too high relative to the R&D budgets of roofing manufacturers and the risk is too great. Firms in this industry historically have limited R&D to projects with a very high probability of success.

3. The roofing business, like housing, is in a severe and long slump with factories being closed and profits critically reduced or non-existent. In fact, Bird & Sons recently reported a 9-month loss of about $15,000,000. Few, if any, manufacturers are making a profit.

4. There are few secrets in the asphalt roofing industry. No firm is going to step out on their own and do this study on their own as the results would soon leak to a competitor. There are few, if any, advantages of being first. The advantages of lead time are markedly overweighed by the cost of the R&D plus the added costs of first trials. So everyone wants to be a follower. Without a leader, there is nothing to follow.

Thus, DoE funding can provide the incentive and funding for the project to move. It will not happen without DoE funding. We urge your support.

Very truly yours,

Carl Vander Linden

Dr. C. R. Vander Linden
Director of R&D
Contracts and Applied Technology

mad

Manville Service Corporation
Research & Development Center
Ken-Caryl Ranch
Denver, Colorado 80217
303 978-2000

Manville

February 4, 1982

Dr. Jerome Collins
Department of Energy
Office of Industrial Programs
Forrestal Building
1000 Independence Avenue, N. W.
Washington, D. C. 20585

Dear Jerry:

This is in response to the discussions we have had on the appropriate relationship on the private sector/Federal sector role in funding of industrial energy conservation projects. Our specific comments relate to the proposal we have submitted to you on "Recovery and Reuse of Asphalt Roofing Waste".

I had already sent you information in my letter of November 16, 1981 why a company such as Manville would not undertake the study on its own. The four reasons given in this letter continue to be valid.

You posed an interesting question as to what posture we would take about continuing the study if the Phase I of the proposal were funded by DoE, and then part way through the program DoE funds were curtailed or shut off. There really is no black or white answer as I believe it would depend on where we were on the project and whether we perceived at that point that the project was pointing to positive results which could be implemented in the industry. If the situation were that the project were well along and the results appeared to be positive, I would expect we would give serious consideration to completing Phase I on our own. On the other hand, if the project were in its very early phases we would probably drop the project for the reasons outlined in my letter of November 16.

I believe you will find that Manville Corp. (formally Johns-Manville) has good credibility with the Industrial Programs Management in how we approach funding problems on a project. We have a cost shared multi-deck dryer demonstration project which we are carrying on at our Rockdale, Illinois plant.

Last summer, when it became obvious that we were going to experience significant increases in cost due both to inflation and some unexpected design problems, we came to Washington and explained the problem. In recognition of the very serious funding problems the DoE Industrial Programs were facing, and the fact that we were well along in the procurement and construction, we proposed to continue by markedly increasing our cost sharing. According to our contract we could have expected DoE to fund $334,140 of the $345,900 added costs. Instead we proposed that we fund $221,100 of the added costs and limit the DoE share to $124,800. We were verbally complimented by DoE people for making such an offer which DoE accepted. The effect of this change resulted in our cost sharing about 30% rather than 3.4% of the cost of the project in addition to the $250,000 of capital equipment we purchased at our expense.

I thought you should know this as we have a track record of being reasonable people who want to see a job carried to completion.

I hope this adequately responds to your questions. We hope you will proceed with the funding of the proposal as the results are important to the asphalt roofing industry.

Very truly yours,

C. R. Vander Linden
Director of Contracts, R&D

CRVL/lv

GCA

GCA CORPORATION
Technology Division
213 Burlington Road
Bedford, Massachusetts 01730
Telephone 617-275-5444
Telex 92-3339

February 4, 1982

Mr. Dennis W. Brinkman
Supervisory Research Chemist
U.S. D.O.E.
P.O. Box 1398
Bartlesville, OK 74003

Dear Dennis:

We've seen some reports in the press and heard other reports from within the Department of Energy that ongoing contract research programs may be terminated within the very near future. If the work we're doing for you now under DOE Contract No. DE-AC19-81BC10375 entitled, "The Fate of Hazardous and Non-Hazardous Wastes in Used Oil Recycling" is stopped at this time, we at GCA think the results would be tragic.

The disposal of large volumes of used oil by burning, sewer disposal, and road oiling are practices that now exist and will continue unabated in the near future. It is imperative that information concerning the fate of used oil contaminants during their disposal activities be experimentally verified. As you know, some of the contaminants which we are investigating include PCB's, benzene, pesticides, herbicides, trichloroethylene and heavy metals — all of which can be dangerous, even poisonous.

We've gone past the start-up phase of the program. Substantial time, effort and money have been spent to set up our experimental apparatus, develop our analytical procedures and schedule field tests at commercial reuse facilities. If the program is terminated now, the Dept. of Energy will have paid for the start-up efforts; yet, they will have no data.

To continue the work is to obtain experimental data which are essential to solve a difficult national problem. The extent and gravity of the problem of PCB-contaminated waste oil was highlighted recently on "20/20" - a national network news program. To continue the work will also recoup the investment made in start-up costs. The experimental data to be generated are being eagerly awaited by industry and state energy conservation and waste oil reuse agencies. We urge you to argue within D.O.E. to continue the program.

Very truly yours,

Paul F. Fennelly

Paul F. Fennelly, Ph.D.
Manager, Environmental Measurements Department

PFF/mm

cc: Bruce Cranford-U.S. D.O.E.

TECHNICAL ASSISTANCE AND BUSINESS SERVICES
TELEX 944479

**Gorham International Inc.**
ESTABLISHED 1958

GORHAM, MAINE 04038, U.S.A. · TELEPHONE: 207/892-6761 · CABLE ADDRESS: GORHAM · PORTLAND, MAINE
OUR NEW CORPORATE TELEPHONE NUMBER IS 207/892-2216

February 4, 1982

Mr. Stuart Natof
U.S. Department of Energy
Forrestal Building
Mail Code CE 121
Washington, D.C. 20585

Dear Mr. Natof:

I have been reading the papers and watching the news on TV -- the message is clear. Cut - cut - cut out federal programs, grants, projects and now I hear even on-going contracts are being terminated. If contracts like Gorham's IFD project are to be cut off, how are the wide ranging benefits this project will produce going to be accomplished?

The 500 MM Bbls of oil per year which forest residues represents can start replacing oil as soon as five years from now if this project goes full term. But if funding is cut off now who is going to pick up the project and bring it to conclusion?

Before Gorham ever asked for D.O.E. support we sent proposals to all major pulp and paper companies, engine manufacturers, boiler companies and certain other energy intensive companies. We got a better than average response -- all negative. When asked why support was not available a few were willing to bluntly say, "What's in it for us -- us exclusively. Before we can support a risky research project like drying forest residues in the forest we would have to see an exclusive advantage. Our money cannot support projects that benefit everyone -- they have to benefit us first, most, and hopefully exclusively."

Gorham International would benefit exclusively if it could raise the money to fund this project itself -- but it cannot. The risk is too high for banks to help and Gorham is not a capital intensive business. We have only meager assets on which we could borrow money. Our major asset is brain power and you can't use that at the bank.

The situation is worse now than it was when industrial support was first sought. Gorham has spent what it could on this project already. Industry prospects for support are less bright than when we sought support previously. In my judgement we would stand even less chance of gaining support from industry now. State funds have dried up also. The only people I see that would be interested in converting forest residues into a form more suited to long distance transport are the Japanese. They are constantly asking for more information about this project. That is not where this fuel and feedstock resource ought to go -- it needs to be used in these United States to help our own energy situation. In a nut shell if Federal money is shut off this project will die.

Well, I have said my piece -- if anybody wants to cut this IFD project off before its benefits can be developed, show this letter and give whoever it is my phone number. I want a fighting chance to say my piece to him -- if it ever comes to that.

Sincerely,

GORHAM INTERNATIONAL INC.

Willard C Sawyer

Willard C. Sawyer
Director of
Biomass Conversion

WCS/d

MASSACHUSETTS INSTITUTE OF TECHNOLOGY *CAMBRIDGE, MASSACHUSETTS 02139*

Room 8-409

January 28, 1982

Dr. Michael B. McNeil
U.S. Department of Energy
Forrestal Building, 2H-085
Washington, DC 20585

Dear Dr. McNeil:

In relation to a proposal entitled "Diagnosis of Sources of Current Inefficiency in Industrial Molten Salt Electrolysis Cells by Raman Spectroscopy" which has been submitted to your agency, I should like to add several comments.

First of all, this project seeks to make use of Raman spectroscopy in the analysis of operating industrial electrolysis cells. The proposal describes the sequence of research beginning with the adaptation of a commercial Raman spectrometer for use with a high temperature specimen contained in a window furnace, through testing of magnesium and aluminum electrolyses in chloride melts, culminating in measurements of laboratory scale Hall-type electrolysis of aluminum metal from molten cryolite. With its attention to melt chemistry as monitored by Raman spectroscopy the project attempts to solve an engineering problem through research into the basic science on which electrolytic technology is based. As such, I believe this to be a generic, long term project in keeping with the agency's mission.

Secondly, the point must be made that although the problem of current inefficiency in electrolysis cells is an industrial matter, one cannot presume that industry will undertake such a project in an attempt to solve this problem. In fact, in my conversations with high ranking scientists and managers at companies such as Alcoa, Dow, and Reynolds I have learned two things from these people. First, the successful completion of the work proposed would have a considerable impact on energy conservation throughout the light metals industry. Secondly, without any doubt it can be stated that no metals producer will undertake such a venture in its own research organization. None of these companies has either the facilities (Raman instrumentation) or the personnel. Furthermore, these companies are not about to commit the necessary funds to acquire these research capabilities in today's economic climate.

Thus, I feel that if the Department of Energy decides not to sponsor the proposed work, then it simply will not be done. Certainly, I do not have the resources at hand for such a study. As for potential sponsors elsewhere, I have made representations to the National Science Foundation, the Office of Basic Energy Sciences at the Department of Energy, the Army Research Office, the Office of Naval Research, the Air Force Office of Scientific Research, and the Bureau of Mines. None of these agencies would sponsor the work, although the proposal repeatedly received favorable ratings in peer review.

In conclusion, I should state that it is in the national interest that a project of this type be supported. In view of the staggering amounts of electrical energy consumed in the electrolytic industries (the figure exceeds 100 billion kWh/yr or 1 Quad/yr), diagnosis of sources of current inefficiency in industrial cells is more than just an academic exercise. This is particularly true for the proposed technique of investigation which has excellent prospects for adaptation to on-line process control which would conserve considerable energy.

The aluminum industry alone consumes four percent of total generated electrical energy in this country. Hall cells continue to operate at voltages in excess of twice the theoretical requirement. The electrochemical techniques of investigation are well known to the industry. I believe that it is time for a bolder innovative approach to the problem and that Raman spectroscopy is just that.

Yours sincerely,

D. R. Sadoway

Donald R. Sadoway
Assistant Professor
Materials Engineering

DRS:ebs

**New York University**
*A private university in the public service*

Graduate School of Business Administration

114 Liberty Street, Room 500
New York, N.Y. 10006
Telephone: (212) 285-8946

Center for Science and Technology Policy
Herbert I. Fusfeld, *Director*

January 28, 1982

Dr. Michael McNeil
Department of Energy
1000 Independence Avenue
Washington, DC 20585

Dear Dr. McNeil:

Comminution was identified as a large consumer of energy in the 1973 National Academy of Science Committee report "Materials Requirements in the Near Term Energy Program." I was a member of that committee and, when I became Chairman of the Energy Council of the National Materials Advisory Board of the National Research Council, I put together a select committee, under the joint sponsorship of DOE, NSF and the Bureau of Mines, to study this matter. I was asked to serve on this committee.

In the spring of 1981 this committee published the National Academy of Sciences report, "Comminution and Energy." Among the highlights of the report were the facts that one billion tons of rock ore and minerals were ground annually in the United States. This grinding consumed one million tons of steel and 32 billion kWh of energy. Most of the grinding methods and devices are archaic and, if only existing technology were applied, 20% of the energy consumption could be saved, amounting to $160 million/year. In addition, there are strong indications that with further research 50% of the energy could be saved. The report called attention to past neglect by government funding agencies which had not recognized either the enormous aggregate energy consumption of comminution or the potential for improvement.

With the publication of this report, federal agencies, particularly DOE, are rapidly turning their attention to this field. Research is not inexpensive, however. Before a laboratory finding can be introduced to a mill costing hundreds of millions of dollars it must go through both pilot plant and demonstration plant testing, which is expensive. In meetings and workshops with mining companies I found that they have little interest in such expenditures for, as long as other mining companies don't change, all remain competitive. Therefore, at this stage a government role is imperative. When the government is willing to put up part of the money for R&D it has a good negotiating position to encourage companies to either co-fund or to take over when feasibility is demonstrated.

We have held two workshops since the NAS report at the New York University Center for Science and Technology Policy on the subject of comminution efficiency improvement. In attendance were representatives of government, universities, mining companies, equipment manufacturing companies, and engineering construction firms. The conclusion was unanimous in that industry, government and universities should turn their attention to this long-neglected field and cooperate in innovation.

The negotiations between these diverse sectors have been long and delicate with respect to the appropriate role of each. These difficulties have been largely overcome and within the next few months a series of research programs will be cooperatively identified by these sectors. At this stage it would be simply disastrous for federal funding to be reduced for the field of comminution. The enormous potential for energy saving of hundreds of millions of dollars per year, reduced dependency on oil imports, as well as the careful nurturing of trust by a major industry of the federal government after years of an adversarial relationship, could all be wiped out by a decision over a comparatively small amount of money.

Sincerely yours,

Arthur C Damask

Arthur C. Damask
Visiting Professor

vb

TENNESSEE VALLEY AUTHORITY
MUSCLE SHOALS, ALABAMA 35660
National Fertilizer Development Center
October 28, 1981

Mr. William Sonnett
Branch Chief
Agriculture and Food Process Branch
Division of Industrial Energy Conservation
1000 Independence Avenue, S.W.
Department of Energy
Washington, DC 20585

Dear Bill:

I was pleased that you and David had some interesting discussions concerning the TVA pipe-cross reactor process for the production of diammonium phosphate and monoammonium phosphate. I am sorry that I was out of the country when you called. However, Supra, Landskrona, Sweden, agreed to pay TVA for my expenses to assist them in the use of the TVA pipe-cross reactor to produce MAP. The tests were quite successful and some of the information I learned in this project will be helpful in our current project with DOE.

We have not had as much success in the production of diammonium phosphate with the pipe-cross reactor. The main reason for this poor success has been that the companies are unwilling to make the investment required for a pipe-cross reactor. This is because they have had a poor profit situation this year. Therefore, we are proposing an amendment to our contract which will allow us to build an experimental commercial size pipe-cross reactor for use by the diammonium phosphate producers. Enclosed is a draft of the proposed amendment to the contract. In our proposal we are requesting an additional $202,000 to build, install, and test a newly designed pipe-cross reactor which will be installed in a commercial plant. It is our opinion that either W. R. Grace or IMCC will cooperate with us in this project.

If we can give further assistance with this project after you have reviewed the proposal, please let us know.

Sincerely yours,

Frank P. Achorn

Frank P. Achorn, Senior Scientist
Process & Product Improvement Section
Division of Agricultural Development

Enclosure

# PROPOSED AMENDMENT TO THE DOE-TVA PIPE-CROSS REACTOR PROJECT FOR THE PRODUCTION OF DIAMMONIUM PHOSPHATE AND MONOAMMONIUM PHOSPHATE
## CONTRACT TV-54521A DE-A101-80CS40453

During the past year our Process and Product Improvement Section chemical engineers have been in continuing contact with primary phosphate producers in the United States to discuss with them the merits of the pipe-cross reactor process for the production of diammonium phosphate (DAP). In several instances we have made specific design recommendations for these DAP pipe-cross reactors. Although there has been some interest in the process and one primary producer in Louisiana continues to use the pipe-cross reactor for a portion of their DAP production, no primary phosphate producer has opted to use a pipe for all of their DAP production. While the profits from the production and sale of DAP were substantial about a year ago when we began this project, the production of DAP at this time results in little or no profit. Because of these poor market conditions, the commercial firms do not want to risk the use of capital in an unproven research project of this type. Because the commercial fertilizer firms are unwilling to fund this project at this time, we will need to use a new approach in our effort to test the new TVA pipe-cross reactor process for the production of DAP. We want to construct a pipe-cross reactor which utilizes our latest design criteria. This PCR would be offered to a commercial firm for testing in their plant. This new program will help solve unknowns which now exist.

We are making the following additional funding proposal to further our efforts toward completing the research work on this process. The specific dollar amounts we are requesting and how they will be spent are listed below:

| | | |
|---|---|---|
| 1. | Design and fabrication of a DAP pipe-cross reactor for an individually selected primary phosphate producer. | $70,000 |
| 2. | Installation of this DAP pipe-cross reactor at commercial producer's DAP granulation plant. | 30,000 |
| 3. | Initial test work and debugging of DAP pipe-cross reactor process in primary producer's plant | 50,000 |
| 4. | Overhead | 52,000 |
| | Total | $202,000 |

We feel that once we have the first plant properly operating with this DAP pipe-cross reactor process, the other primary phosphate producers will observe that enough of the risk has been eliminated and will also install pipe-cross reactors. We continue to believe that the DAP pipe-cross reactor process has merit. Pilot plant tests and the initial pipe-cross reactor work at the plant in Louisiana continue to be encouraging. Lower recycle ratios, reduced fossil fuel input to the dryer, and higher operating factors for the existing DAP plants are obtainable.

The major obstacle between us and the completion of this project is economic in nature. The ongoing technical rapport between our engineers and representatives of the primary phosphate producers continues to be strong. The downturn in the economy, and specifically DAP producers' diminished profits, has made them hesitant to take any risks with new technology at this time. We believe there will be substantial energy savings if additional DOE funds can be appropriated at this time to eliminate this risk.

December 17, 1981

Robert G. Massey
Office of Industrial Programs
U.S. Department of Energy
Forrestal Building CS-40
Washington, DC. 20585

Dear Bob,

The MTBE plant at Charter International Oil Co., Houston, Texas, which is demonstrating our novel catalyst system, has now been on stream for six months using the replacement catalyst charge provided by the DOE. I'm happy to report that the catalyst shows no signs of deactivation and everyone is very favorably impressed with the entire system's operation.

It is appropriate that the DOE be given credit and our sincerest thanks for helping this novel technology survive a very critical development period. The research funding itself has been vital to the technical evolution of the catalyst system, but without DOE support the accidential poisoning of the first charge of catalyst would have been a catastrophic loss to CR&L. Had it not been for the DOE funded replacement charge, that early mishap could have blocked fair evaluation of the catalyst system or, at best, would certainly have significantly delayed acceptance by the industry of what now appears to be a solid tool for improved energy management in chemical process engineering.

Again, our sincerest thanks to the DOE for its research funding and backup catalyst guarantee and my personal thanks to you, Bob, for your encouragement and guidance. I look forward to a continued mutually productive relationship in improving the catalyst system and expanding its uses into other application areas.

Sincerely,

Lawrence A. Smith

Lawrence A. Smith, Jr.
President

LAS/lr

**National-Standard**

**Corporate Headquarters**

February 4, 1982

Dr. J. F. Collins
D.O.E. Office of Industrial
Programs
P.O. Box 23849
Washington, D.C. 20024

Re: National-Standard Company/D.O.E.
Cooperative Agreement
No. DE-FC-07-801D12163

Dear Dr. Collins:

We wish to respond to your question of our continuation of the above project if the D.O.E. were to withdraw its support.

Initially, we believe it should be pointed out that the D.O.E. solicited contract proposals inviting the private sector to enter into a cooperative agreement with the Department to develop a technology coverting waste tires into an energy product. National-Standard Company responded to the solicitation for two reasons: we felt that we had the technical capability for the successful development of the required technology and secondly, that the amount of money already expended on waste tire disposal prohibited further capital outlay without third party participation. Additionally, the support and assistance of the D.O.E. was key in our determination to submit the proposal.

While the development has so far gone very well (ref. S.Y.P.A.) and the tire industry is responding with a high degree of interest, we cannot seriously expect any company to commit the substantial capital required for a commercial system before our successful demonstration of a system utilizing the new technology. Further, we believe the completion of this project is required to produce engineering data for the design of larger units. Without customer commitments and with the risks in developing any new technology, further research and development work by the Company without the Department of Energy funding would be unwarranted.

Niles, Michigan 49120 • Tel: 616/683-8100 • Telex: 25-8453 • TWX: 810-270-3153

It is our belief that the system will result in a new product line which will benefit both our Company and the country, and we are continuing in our efforts toward realization of a successful project. We look forward to the Department of Energy's continued support and assistance.

Very truly yours,

G. H. Frieling, Jr.
President and
Chief Executive Officer

GHF/grf

Eastern
Products
Corp.

February 5, 1982

Dr. Jerry Collins
P.O. Box 23849
Washington, DC 20024

Dear Dr. Collins:

In response to your question as to the fate of our co-operative Waste Tire Program should the Department of Energy withdraw its' support, we have reviewed our position and capabilities and although we feel that the program will result ultimately in a successful business, we could not proceed without DOE's financial support.

The program we submitted in our proposal, we believe to be, a unique and efficient approach towards solving the problems of waste tire disposal.

Towards that end, and aided in great part by the DOE's contribution in the co-operative contract, Eastern Products has made great strides in successfully testing our methods. Indeed, as our Test Report (Co-fired Tire Derived Fuel and Oil) will show, we are successful in displacing 17% of our test host's oil needs with T.D.F. (saving of oil gal./yr., approximately ½ million gallons per year at host's facility).

We have proven the technical feasibility of co-firing T.D.F. with oil or coal (in Fluidized Bed Testing). The question of viability from an overall point of view still remains to be answered. Research is required to determine if the collection and processing of waste tires on a large enough scale to support a business is economically possible. This was the original intent of this DOE Project. Eastern Products could not generate enough capital to finance the complete project, nor because of the nature of this business, i.e., collecting scrap tires from many sources - do we believe that a large corporation would be interested in financing this type of business which in order to be profitable requires a company with exceedingly low overhead and familiarity with scrap rubber business such as Eastern Products.

More research must be completed before we could hope to attract the capital necessary for start-up. However, we believe that once we have developed the overall economical feasibility we will be able to finance other plants in major metropolitan centers to solve the problem of glut of waste tires, and to make a siginificant reduction of oil consumption.

214 Commercial Street, Malden, Massachusetts 02148 617-324-2400/TWX 710-348-2299
Plant: Dale Street, Andover, Massachusetts 01810 617-475-5133

I personally feel that it would be very sad indeed if we were forced to drop this project. We have come a long way and believe that continuing this program would in not too distant future allow us to displace a substantial amount of fuel oil with waste tires; and help to solve a serious environmental problem.

If I may be of any further assistance in this matter, please do not hesitate to call.

Very truly yours,

EASTERN PRODUCTS CORP.

Arthur H. Feinberg
President

cc: Mr. William Thielbahr

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CENTER FOR POLICY ALTERNATIVES

CAMBRIDGE, MASSACHUSETTS 02139

E40-245

(617)253-1666

February 2, 1982

Dr. Jerome Collins
Department of Energy
Office of Industrial Programs (CS-40)
1000 Independence Avenue
Washington, D.C. 20585

Reference: Institutional Agreement Ex-76-A-01-2295
Task Order No. 53 (Remanufacturing)

Dear Jerry,

This letter is in response to your recent request for an opinion on the consequences of curtailment of our present remanufacturing study and a judgement on the likelihood of the private sector picking up and utilizing our research results at this present stage of development. The latter part of your question is particularly pertinent in this instance, because our project is structured toward the transfer of our knowledge to industry.

As you know, we have assessed the energy savings possible through remanufacturing, and have found a 5-to-1 energy recapture ratio. This means that every kilowatt hour of energy expended in remanufacturing saves five kilowatt hours of energy embodied in discarded products. If only 5% of remanufacturable products were remanufactured each year, the dollar value of energy savings would be in excess of $300 million (1976 values).

Our project has set about to demonstrate analytically that such potential energy savings can be accomplished, and to develop technological and managerial insights for those in the private sector who can increase the rate of remanufacturing being done in the U.S.

We have conducted a number of studies of technology transfer at the Center for Policy Alternatives. I have personally conducted two in the past six years. Under the very best of circumstances, university-to-industry technology transfer is difficult. It becomes impossible, if the information to be transferred is still in an incomplete, amorphous state. Before a firm can be convinced to put aside its normal reluctance to launch any sort of new venture, the proposition must be reduced toconcrete terms fitting the firm's, economic and technical frame of reference. This particularly true for remanufacturing, which is an unconventional form of business activity.

Our project is at that critical point where we are integrating what we have learned about the technology, economics and management practices of remanufacturing into practical guidelines for industrial application. To curtail the project at this juncture would mean the elimination of this essential step in technology transfer, and it would also mean the abandonment of our search for specific firms who are willing to establish a remanufacturing venture on the basis of these guidelines. When the project is finished later this year, we should have accomplished our goal of technology transfer to private industry. If terminated now, this will not be accomplished, and a major part of the useful insights we have gained during our three-year project would be lost.

Very truly yours,

R Lund

Robert T. Lund
Assistant Director

RTL/kab

### PRIVATE INDUSTRY FUNDING OF ENERGY R. & D.

Mr. **Murtha**. How would you respond to these individual statements which I just quoted?

Secretary **Edwards**. Mr. Chairman, I guess my first response would be that the record shows that between 1979 and 1980 the research and development expenditure of the fossil fuel industry was up by 27 percent during that time period and that was before the President's economic recovery program was passed. In that program, as you know, there is a tax credit for research and development in addition to what existed between 1979 and 1980.

So, I think the facts show that these may be special interest groups that have some special interests in certain programs that are funded by the Government. The overall picture and facts involved just don't back that up.

Mr. **Murtha**. So, overall, private industry is taking over the research because of the tax credits, you think?

Secretary **Edwards**. I think so, yes. It is a little early to tell what the full significance will be because, as you know, the economic recovery program has not been in place long enough but there are signs to show that there is an increase.

Mr. **Murtha**. But the business side of it has been in effect—it was retroactive to the first of last year. I would hope that by this time you would be getting some results.

Secretary **Edwards**. Well, there is a May 1981 study of business plants, research and development expenditures from 1981 to 1984 put out by McGraw-Hill and it shows that U.S. companies in the manufacturing sector were expected to spend $4.8 billion on energy R&D in 1981, a 10 percent increase over 1980. By the way, it amounts to 10 percent of the total R&D expenditures of all companies.

The study was completed before the enactment of the 25 percent tax credit for research that was included in the Economic Recovery Tax Act.

The study projects energy R&D to reach $5.5 billion by 1984, 28 percent above the 1980 figure. So that backs up to the figure that I just was quoting. So it shows that there will be increased expenditures for R&D.

Mr. **Murtha**. I am pleased to recognize the chairman of the Appropriations Committee, Mr. Whitten.

Mr. **Whitten** [presiding]. Thank you. I am very glad to see you again.

Secretary **Edwards**. Nice seeing you.

### REORGANIZATION OF ENERGY FUNCTIONS

Mr. **Whitten**. I made a statement at another subcommittee that once you get your hands on the Department of Energy you are ready to turn it loose.

The Attorney General is already asking for money for operations. If we divide all this out in half a dozen different Departments and Agencies, we are going to be calling you back here, because they do not know anything about it. He plans to move your folks there, and they will be in various sections in town.

Secretary **Edwards**. That is in the Enforcement Section, I assume.

Mr. **Whitten**. I do not know. We could mess things up so they might have the Enforcement Section somewhere else and the Operating Section under the Attorney General.

Secretary **Edwards**. Confession is good for the soul.

### MHD PROGRAM

Mr. **Whitten**. All these Agencies are proposing to spend money for programs that are unfamiliar to them. The MHD program, which is in my State, and my interest comes from prior knowledge of it—is that a case of anticipating that your Department would be abolished? What is the basis for going this far and then quitting?

Secretary **Edwards**. Mr. Chairman, I guess the basis for going this far and then quitting is that at times when we have severe budgetary restrictions, when we are trying to cut the deficit down, we reached a point in this program where to carry this on through proof of concept we will have to invest in some sort of a plant, 250-megawatt facility that will cost $500 million. When you look at it versus other technologies such as fuel cells and pressurized fluidized bed combustion, integrated gasification, combined cycle, there is really not that much advantage of MHD over those other more advanced technologies that we know. We are probably 15 years away minimum. So looking at that versus the budgetary restrictions, we have to make some priority decisions, and that was one of the decisions we made.

### BUDGET PRIORITIES

Mr. **Whitten**. The reason I asked, I am proud to say, the Appropriations Committee has been very cooperative with the President. At the beginning of his term, I personally was asked to discuss the debt ceiling with the President, and he acted in line with what I thought was the way it should work.

Subsequent to that, he asked the Appropriations Committee to rescind fiscal year 1981 appropriations of $15.1 billion. We rescinded $14.3 billion, 95 percent, I believe are the figures. Then we made some additional increases of about $1.5 billion. Then the President issued amendments for 1982 in March. We went along in the Appropriations Committee and got the further cuts through the Congress. I thought we were doing what he wanted in the continuing resolution, but after we got the Republican Senators to sign the conference report, he vetoed the resolution.

What I am looking at now is the fact that while we agreed to cut down spending, we are finding now that the Administration is transferring it from these operations to more military spending. You notice the words I used, and I use the Department and the Administration's own words. I had an investigation started last February, and when you see the amount of waste, for instance, Defense let a contract to the lowest bidder and there were 1,600 changes in one ship. We are faced with proposals to cut money from these programs so it can be spent on military spending.

You may have read today where the Secretary of Defense said if you cut defense down, you will be cutting jobs down. He does not distinguish between productive jobs and inflationary spending. I say this because I asked him questions. If we should perchance find other places to live up to your desires or the Administration's desires to cut down spending, or if we decided where you have proposed to put this money is not the best place, what would you do? The Administration has shifted money between programs such as the windfall profits tax cut, that was done in the hopes that business would use the funds for research and development. Unfortunately they are putting it in certificates of deposit. We have allowed moneymakers like IBM and General Electric, to buy tax losses from folks not making money. The Secretary of the Treasury acknowledged that that money is not going into the Treasury. Have you matched this against where they are going to use the money?

Secretary **Edwards**. Mr. Chairman, you are throwing a lot at me at one time.

Mr. **Whitten**. You hold a big job, Mr. Secretary.

Secretary **Edwards**. There have been priorities set in this Administration by the President, and as you know, he said one of the high priorities was military capability, and I certainly agree with the President on that, and I hope it can be done in an efficient and effective manner. Secretary Weinberger is well known for his managerial ability.

Mr. **Whitten**. Well, he was. I wish you would read his answers to my questions the other day.

Secretary **Edwards**. I think there is a combination of several things. I think it has to do with the military expenditures. We want to build the military. We want to address ourselves to the economic problems of this Nation, and a lot of people seem to think that that is directly related to the deficits that we have. At one time I used to think that, but I am not sure now what it is related to.

Mr. **Whitten**. Mr. Regan acknowledged if you took funds from one program and spent it on another instead of paying on the debt that the economic benefits from cutting are lost. That is the Secretary of the Treasury, whom I consider one of the ablest men in the Government. He acknowledged if you save it here and spend it over there that you do not get the benefits of cutting back, because you spent it anyway for something different. This economic situation is serious with me. I join with you and the President and everybody else in hoping to goodness that it is short-lived. I told him what we are threatened with, 30 years ago we could not buy a sack of flour on the credit of our State or any other State——

Secretary **Edwards**. I am old enough to remember some of those days, too.

Mr. **Whitten**. They point out I have been here that long. They say if you are careful when you date your stories, nobody can contradict you.

### MHD PROGRAM TERMINATION

We were just notified that the Tennessee Valley Authority is closing down two power plants. Now, if they base that on the slowdown in industry, that would be one thing, but they have spent over $2 billion, and are closing it just when they are fixing to get benefits from it. The MHD program has been going on for 10 years, and the benefits are several years in the future. There is a question whether it is good business to stop this type of effort when you get in sight of the benefits that you anticipate.

Secretary EDWARDS. You know, Mr. Chairman, I really think that we are further away from the final development of this technology than you might think we are. I would say we are at least 15 or 20 years away.

Mr. WHITTEN. I just know that we are stopping before we get to the benefits.

Secretary EDWARDS. I can understand your desire to maintain the investment, and I think that the way we have planned to close this down, I think we can preserve the milestones that have been accomplished in the program and collect the data in a logical way so that we can keep the key technical data collected for future use if some private sector company wants to come in and push us ahead or if later on we become flush with money as a Government and want to go back into the research business for long-term research like this.

Mr. WHITTEN. I will quit with this. Why did you pick this one as opposed to other projects you have?

Secretary EDWARDS. We picked just about every one around.

Mr. WHITTEN. You think that upsets me. It proves my point. We cut programs with a hope of dividends and give it to those where I cannot see we get anything. I am talking about military spending. I cannot see defense in much of it. We have got to have defense, this thing of letting Russia get the first lick and kill a third of our people, and not being able to hit back. We need to give attention to preventing war. That is all beside the point. But if the committee—if the Congress were not to abolish your Department and if we were to cut the funds in some other areas, how would you look at this particular project from an individual standpoint?

Secretary EDWARDS. Mr. Chairman, as we look at set priorities, this project is not one of the high-priority projects that I would fund. There would be others that would come before this, probably.

Mr. WHITTEN. How many, roughly?

Secretary EDWARDS. I will refer that to my Assistant Secretary for Fossil Fuels.

Mr. WHITTEN. That is what you hired him for.

Secretary EDWARDS. He handles the tough questions.

Mr. MARES. We would prefer to do a lot of other projects before we would invest in this one, and the reason is that the cost to do the proof of concept, which is the next big stage, is very high for this project or this type of technology, and to put that amount of money into that technology instead of putting the same amount into a multiplicity of other technologies I do not think is technically sound. So I would not—I would urge you not to try to put large amounts of money into the MHD program.

Mr. WHITTEN. We have just got to have a dogfight on that. I would like you to put in the record the value of this program and what you have spent and what the expectations are. I realize, Mr. Secretary, that you have an overall budget and you have problems staying within it. I think the record shows, at this point, that you were told at the OMB level that you could have this much money and you have to spend within that budget. I raise again that you have been very candid in the hearings I have had, and it creates a wholesome atmosphere. I do not know but what we need to keep you here along with this Department. Energy programs were separated to start with, we brought them together, and we will lose 4 or 5 years if we do not keep them together.

Thank you, Mr. Chairman. Finish your answers in the record as you see fit. I asked them so you could put your side of it in the record.

Secretary EDWARDS. Thank you, Mr. Chairman. I appreciate your kind comments, but I do not know how many more of these honors I can afford.

Mr. WHITTEN. When times are tough, you have to stay in there and pitch, Mr. Secretary.

[The information follows:]

### FUNDS EXPENDED ON MHD AND MHD EXPECTATIONS

Attachment I provides a budget summary of funds spent on MHD from fiscal year 1971 through fiscal year 1982. It also lists the total funding expended on each major MHD program element since 1971. Attachment II lists the current technical status of MHD technology. In the early 1970's there were few operating MHD components and there was little or no engineering data for the key MHD components, so the cited status charts essentially show the accomplishments since the early 1970's. Attachment II also shows that the MHD program has attained all technical milestones (i.e., technical expectations) that have been established to date. The critical MHD engineering design base (through a scale of 20 MWt) has been established to allow the initiation of a 28 MWt scale HRSR (bottoming cycle) test program at the Coal Fired Flow Facility (CFFF) in Tullahoma, Tennessee, and a 50 MWt scale MHD power train (topping cycle) test program at the Component Development and Integration Facility (CDIF) in Butte, Montana, supported by key diagnostic instrumentation development activities at Mississippi State University. The CDIF was formally activated on February 10, 1982, and the CFFF a few months earlier.

### ATTACHMENT I

### MHD SYSTEMS DEVELOPMENT: A HISTORICAL BUDGET SUMMARY

Since fiscal year 1971, approximately $420 million has been appropriated for MHD systems development. However, the total funding during the period that the MHD program resided within the Office of Coal Research (1971-1975) amounted to about only $25 million. The major MHD development activities were not initiated until the 1975/1976 time period, with the formation of the Energy Research and Development Administration. The approximate specific funding by fiscal year was as follows:

| Fiscal year: | *Millions* |
|---|---|
| 1971 | $0.6 |
| 1972 | 1.0 |
| 1973 | 3.5 |
| 1974 | 7.5 |
| 1975 | 14.3 |
| 1976 | 37.3 |
| 1977 | 40.0 |
| 1978 | 71.5 |
| 1979 | 77.0 |
| 1980 | 79.0 |
| 1981 | 61.0 |
| 1982 | 27.8 |

The funding summary by specific technical program elements is approximately the following:

| I. Facility construction and activation (including test articles): | *Millions* |
|---|---|
| A. CDIF (activated Feb. 10, 1982) | $108 |
| B. CFFF (activated Dec. 8, 1981) | 46 |

| | |
|---|---|
| II. Component development in support of CDIF/CFFF engineering qualification tests: | |
| A. Coal combustor development | 25 |
| B. MHD channel development (including AEDC facility construction) | 60 |
| C. Superconducting Magnet Development | 35 |
| D. HRSR (steam bottoming cycle, seed recovery, and emission control) | 20 |
| III. MHD plant design and analytical modeling | 20 |
| IV. Supporting research | 50 |
| V. Closed cycle MHD research | 10 |
| VI. U.S./U.S.S.R. program | 20 |
| VII. Field management and general support | 26 |
| Grand total | 420 |

## ATTACHMENT II

# KEY TECHNICAL AREAS

- ELECTRODE / GENERATOR DURABILITY
- GENERATOR / COMBUSTOR PERFORMANCE
- EMISSION CONTROL
- SCM PERFORMANCE
- HEAT RECOVERY BOILER PERFORMANCE / DURABILITY
- SEED RECOVERY / REGENERATION

[illegible]

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| MHD CHANNEL DURABILITY | • 2000 HOURS UNDER COMMERCIAL OPERATING CONDITIONS | • 1000 HOUR TESTING UNDER SIMULATED PROTOTYPIC CONDITIONS (20 MWt)<br>• EXTRAPOLATED ELECTRODE SERVICE LIFE: [illegible] HOURS | • 2000+ HOUR TESTING TO CONFIRM EXTRAPOLATIONS<br>• INTEGRATED, LONG-DURATION, COAL-FIRED POWER TRAIN TEST AT THE LARGEST POSSIBLE SCALE (50 MWt) |

AGR1252-17

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| MHD CHANNEL PERFORMANCE | (FUNCTION OF SCALE)<br>• 20% E.E. FOR MATURE COMMERCIAL PLANT<br>• 15-20% E.E. FOR EARLY COMMERCIAL PLANT<br>• 12-15% E.E. AT 200 MWt SCALE WITH A 6T MAGNETIC FIELD<br>• 6-8% E.E. AT 50 MWt SCALE WITH A 6T MAGNETIC FIELD | • 10% E.E. AT 200 MWt SCALE WITH A 3.2 T MAGNETIC FIELD<br>• CDIF TESTS UNDERWAY | • COMPLETION OF TEST SERIES TO DEMONSTRATE A MINIMUM OF 12% E.E. AT 200 MWt AND 4.5T MAGNETIC FIELD<br>• COMPLETION OF CDIF TEST SERIES, DEMONSTRATING AN ENTHALPY EXTRACTION OF AT LEAST 3% (WITH SCR) OR 5% (WITH SCR) WITH COAL-FIRING |

AGR1303-10

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| COAL COMBUSTOR PERFORMANCE/ DURABILITY | • DURABILITY: 10,000 HOURS<br>• PRESSURE: 5-6 ATM<br>• CONDUCTIVITY: 7 MHO/M<br>• HEAT LOSS: 3-5% AT 500 MWt (SCALE DEPENDENT)<br>5-8% AT 50 MWt<br>8-10% AT 20 MWt | • DURABILITY: NO MAJOR LIFE LIMITING PHENOMENA OBSERVED AFTER SEVERAL HUNDRED HOURS OF TESTING COMBUSTORS AT A SCALE OF 10-20 MWt<br>• PRESSURE: 5-6 ATM (20 MWt)<br>• CONDUCTIVITY: 6 MHO/M (20 MWt)<br>• HEAT LOSS: 10% AT 20 MWt | • DEMONSTRATE 50 MWt-SCALE COAL COMBUSTOR PERFORMANCE<br>• DEMONSTRATE INTEGRATED POWER TRAIN PERFORMANCE WITH COAL AT 50 MWt<br>• SCALING CONFIRMATION |

AGR1252-18

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| **EMISSION CONTROL** | • MEET ALL FEDERAL STANDARDS FOR $SO_x$, $NO_x$, AND PARTICULATES | • ANALYTICALLY DEMONSTRATED CAPABILITY TO CONTROL EMISSIONS TO WELL WITHIN NSPS<br>• AT A SCALE OF 10 MWt, EXPERIMENTALLY DEMONSTRATED $SO_x/NO_x$ REDUCTION TO WELL BELOW NSPS AND MET NSPS ON PARTICULATES<br>• PRELIMINARY DATA, AT A SCALE OF 20 MWt, SHOWED $SO_x/NO_x$ REDUCTION DOWN TO 1/7 OF NSPS | • CONFIRMATION OF PRELIMINARY DATA IN INTEGRATED MHD SYSTEMS TEST AT 20 MWt SCALE<br>• DEMONSTRATION OF PARTICULATE CONTROL AT A SCALE OF 20 MWt |

AGR1303-19

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| SCM PERFORMANCE | • STABLE OPERATION AT 4.5-6T PEAK FIELD 30-YEAR SERVICE LIFE | • SUCCESSFULLY OPERATED A 30-TON 6T SCM IN AN INTEGRATED 20 MWe SCALE POWER TRAIN (U-25B)<br>• SUCCESSFULLY TESTED A 200 TON 6T SCM<br>• NO LIFELIMITING PHENOMENA IDENTIFIED | • ADDITIONAL DATA PERTAINING TO SCM SCALE-UP, CONDUCTOR STABILITY, MODULAR DESIGN FOR SITE ASSEMBLY, AND MANUFACTURING/PRODUCTION |

AGR1282-14

# CURRENT TECHNICAL STATUS

| ISSUE | MINIMUM REQUIREMENT | STATUS | NECESSARY ADDITIONAL DATA |
|---|---|---|---|
| HRSR PERFORMANCE/ DURABILITY | • 30-YEAR LIFE CYCLE DURABILITY OF HEAT RECOVERY BOILER<br>• 99% SEED RECOVERY<br>• < 5% OF PLANT THERMAL PLANT INPUT FOR SEED REGENERATION | • EXTENSIVE INDUSTRIAL EXPERIENCE WITH KRAFT (PAPER INDUSTRY) BOILERS OPERATING IN A SIMILAR ENVIRONMENT<br>• SUCCESSFULLY OPERATED 10 MWt SIMULATED HEAT RECOVERY BOILER<br>• COMPLETED PRELIMINARY SCREENING TESTS FOR CANDIDATE BOILER TUBE MATERIALS<br>• DEMONSTRATED 98% SEED RECOVERY IN A 10 MWt SYSTEM (USSR SHOWED 99% SEED RECOVERY IN A CLEAN FUEL SYSTEM)<br>• IDENTIFIED SEVERAL ACCEPTABLE CANDIDATE SEED REGENERATION PROCESSES | • LONG DURATION BOILER TUBE CORROSION DATA<br>• DEMONSTRATE OPERATION OF A 20 MWt INTEGRATED HRSR SYSTEM<br>• DEMONSTRATE SEED RECOVERY IN A 20 MWt HRSR SYSTEM |

AGR1308-12

## FEDERAL ROLE IN ENERGY

Mr. MURTHA [presiding]. In line with what Chairman Whitten said, I do not think we would consider dismantling the Defense Department, because of its importance, but energy is as important to the defense of this country as anything we do. I am concerned that by the short-term savings we are weakening the country. The more energy we can produce here, the less we can spend for defense, because we would not have to protect the oil lines going in and out of the Middle East or spend the money on the conventional arms we need in order to provide the flexibility in the Middle East.

Secretary EDWARDS. I guess we could talk about constitutional responsibilities, which require that the Federal Government keep a strong military. But it does not say anything about the Federal Government getting into the commercialization business and competing with the private sector, and I guess that is a philosophical difference that this Administration feels that we were a great Nation before the Federal Government started doing everything for everybody. We would like to see it returned to the private sector and let them do the things that in recent years have been taken over by the Federal Government. If we can get out of this kind of business we will have more resources for the Federal Government to address itself to what should be done such as maintaining the military posture and that type of thing. It is a philosophical difference, I guess.

Mr. MURTHA. Mr. Secretary, I will try to keep my questions short, and if you try to keep your answers short, I think we will be able to finish this morning, and you will not have to come back this afternoon.

Secretary EDWARDS. I will be grateful.

## ENHANCED OIL RECOVERY FUNDING

Mr. MURTHA. In looking at the fossil energy budget I find it curious that you have asked for $16 million for enhanced oil recovery when oil is decontrolled and nothing for enhanced natural gas recovery when gas is controlled. Would you answer why you have included oil recovery and excluded the natural gas recovery?

Secretary EDWARDS. Several reasons. Oil is more vulnerable to disruptions, and oil is more important to our national security, because it is used in transportation more than gas is; not that gas could not be used in transportation, but our society is oriented toward oil being used in transportation. Therefore, I guess from that standpoint, oil is given a higher priority. The R&D in enhanced oil recovery is rather long, complex, and risky. It is too costly even for the price incentives we have in the oil business today. We have certain foreign agreements that have to do with enhanced oil recovery, and I guess the final reason we are doing this is that we need to capture the data base so we can capture our investment. So for those reasons we have moved to continue those oil recovery programs rather than getting at the more difficult gas.

## FOSSIL ENERGY INTERNATIONAL PROJECTS

Mr. MURTHA. In the fiscal year 1983 request, you have included funds to continue the U.S. participation in the International Energy Agency, pressurized fluid bed demonstrations at Grimethorpe, England, and the Mobil M gas project in West Germany. Why do we continue funding these international projects and delete similar domestic projects such as the MHD project that Mr. Whitten is concerned about in Mississippi?

Secretary EDWARDS. We are trying to live by those commitments that have been made in the past, foreign commitments, and after these have been terminated, I doubt that we will continue to fund them beyond that point. It is a matter of trying to live by our commitment to foreign countries. These three are very important. We have heavy oils and tar sands in Venezuela and Canada. There are tremendous resources in Venezuela, they have literally billions and billions of barrels equivalent of this heavy oil and tar sands. If we can find ways to handle that we can solve the world's energy crisis for years to come. I think it is a good investment.

Venezuela is doing, if anything, more than their share in paying for this work. The research is being done in this country, and we are getting some of the benefits in this country. The Grimethorpe project will be terminated next year, as I recall. It is an international agreement, as is the M-Gas work with the Federal Republic of Germany. We are trying to live by our international commitments that have been made previous to this Administration.

## SOLVENT REFINED COAL—I

Mr. MURTHA. The committee asked the Department by May 1, 1982, to prepare a detailed cost estimate for the solvent Refined Coal—I demonstration plant. Are you on schedule to get the estimates to us by May 1?

Secretary EDWARDS. The company that is doing that work had some trouble with the subcontractors getting the information together, and they recently asked for a 30-day delay in getting that material to us. I think we will agree we all want a high-quality definitive cost estimate in this area, so we have agreed to go along with them and hope to have that report to you by the 1st of June.

## SYNTHETIC FUELS CORPORATION

Mr. MURTHA. Is it still the position of the Administration that SRC-1 is a viable candidate for Synthetic Fuels Corporation funding?

Secretary EDWARDS. We certainly hope that they will look at it. I think that decision will have to be made by the Synthetic Fuels Corporation. We do not want to get over into their area of endeavor.

Mr. MURTHA. Does the administration have plans to broaden the authority of the Synthetic Fuels Corporation?

Secretary EDWARDS. I am not sure I understand what you are talking about.

Mr. MURTHA. Are you satisfied with the guidelines that Congress has set up? I know they are adhering very closely to those guidelines, and I appreciate that. I think that they are carrying out the mandate of Congress exactly. Do you have any recommendations that you have talked to them about or recommendations to Congress to change anything that has been done?

Secretary **Edwards**. To my knowledge there have been no complaints from anybody in our Department with reference to that, and I have not had any myself. There are no recommendations that I know of that we would like to make.

Mr. **Murtha**. I have a longer question here on conservation, and obviously conservation has a substantial impact on the amount of oil that is saved. There may be some disagreement about what has caused the conservation and the degree of conservation. If you will answer these detailed questions for the record, please.

Secretary **Edwards**. We will be glad to answer any questions submitted for the record.

[Committee note.—The questions and answers are on page 191.]

### STRATEGIC PETROLEUM RESERVE

Mr. **Murtha**. Strategic Petroleum Reserve. Would you explain why the SPR oil acquisition request dropped from $3.7 billion to $2.1 billion in fiscal year 1983?

Secretary **Edwards**. We have basically developed, I think, a well-balanced program. The acquisition requests are a little misleading because in fiscal year 1982 we have filled at the rate of 185,000 barrels a day, and in fiscal year 1983 we plan to fill it at 209,000 barrels a day. By the end of fiscal year 1982 we will have 69 million barrels on order to carry over into fiscal year 1983, and at the end of 1983 we will have 46.3 million barrels that we will have purchased to carry over into 1984, so it is a little misleading. We have postponed the development of one of the storage areas, and we have increased the leaching rate of another storage area so that we can fill it faster up front. The way we have modified the reserve plan will not have effect until 1987, and at that time we will have close to 600 million barrels in the Strategic Petroleum Reserve. I feel we can slow down a bit on the last outyear if we have that much in reserve.

Mr. **Loeffler**. When did you say you would have 600 million barrels in storage?

Secretary **Edwards**. In 1987 we will have 598 million barrels, according to our plan now. And so we have stretched out the Big Hill project and we increased the leach rate of the Bryan Mound project so that we are filling the reserve faster up to 1987 and in 1987, from that point on, it will be a slower fill rate. We thought it was a good balance between the combinations and the programing that we had.

Mr. **Murtha**. Are you working with any alternate storage facilities?

Secretary **Edwards**. We have looked at at least a dozen different possibilities, and we are always looking at the possibility of private storage space. Every time you move the oil from one area to another it costs money to transport it and pump it, so I think if we can get permanent storage, get it in place and build it as rapidly as we can, I think we will be better off as a result of it.

Mr. **Murtha**. Put more details in the record. This committee is very concerned about the SPRO and the alternatives for the storage. We are interested in what alternatives you may have developed and what you are looking at as far as the capacity that we have for storage right now is concerned.

[The information follows:]

### Strategic Petroleum Reserve Alternative Storage

The Department's investigation into alternative storage facilities for the Strategic Petroleum Reserve has consisted of several different elements.

#### OPPORTUNITIES TO ACCELERATE PERMANENT FACILITIES DEVELOPMENT

During the first half of 1981, the Department conducted a formal evaluation of alternative methods of accelerating the permanent storage capacity development for the Reserve, including the potential for using aboveground storage or acquiring existing underground storage either in addition to or in lieu of continued use of solution mining methods.

This early 1981 effort resulted in (1) a decision to increase the brine disposal rate at the Bryan Mound site with consequent acceleration of near-term capacity development, and (2) the transmittal in August 1981 of a report, entitled Strategic Petroleum Reserve Acceleration, to the Office of Management and Budget. The report concluded that beyond the Bryan Mound acceleration mentioned above, further acceleration of permanent capacity development would (a) require significant increases in near-term SPR funding and (b) would not result in major increases in SPR facilities capacity until 1985 or later.

In the latter part of 1981, followup work was conducted to evaluate alternative cost and schedule estimates for aboveground steel tank storage. Furthermore, a series of SPR size and schedule alternatives were developed for use in the SPR size study on which the Secretary plans to make a report to the Congress on May 1, 1982.

#### OPPORTUNITIES TO ACCELERATE NEAR-TERM SPR FILL THROUGH INTERIM STORAGE

The President's fiscal year 1983 budget proposals do not contemplate the storage of SPR oil outside the level permitted by permanent storage capacity. However, as part of the continuing process of program management planning, during early 1982, the Department has undertaken to evaluate possibilities for acquiring oil for the SPR in excess of the rate permitted by permanent storage capacity by securing the use of existing private sector storage on an interim basis.

The analyses have not yet yielded firm conclusions. Some industry sources have indicated that interim storage opportunities exist both in terms of floating storage on surplus tankers and in terms of onshore storage both underground and aboveground. As these options are further defined, the Department will evaluate such options in terms of overall reasonability and practicality. We would need to assure that we had both the budget resources and oil market conditions to maintain development and fill of permanent facilities before we took actions to secure interim storage capacity.

Secretary **Edwards**. You might be interested in the fact that at the end of fiscal year 1983 our capacity will be completely filled and we will have 343 million barrels in place at that time. When we came aboard a year ago, we had 110 million barrels and a 5-year-old program, and I am pleased with what we have accomplished with the Congress' help. We have really poured it in. We are going to dedicate the quarter-billionth barrel on the 1st of April.

Mr. **Murtha**. If we give you this deferral, what assurance do we have that we will not have a delay in the program?

Secretary **Edwards**. With the deferral we will have a delay after 1987. It will stretch it out a year. It will stretch it out from 1989 to

1990, but if you give me the deferral and leave it the way we have it planned, we will have increased fill rates up to—through 1986.

Mr. MURTHA. Could you not again defer it next year then? Are we not starting to play a dangerous game here of deferring and then delaying?

Secretary EDWARDS. We could defer it next year, but I do not plan that.

Mr. MURTHA. Right now you are not planning on asking for another deferral next year?

Secretary EDWARDS. No. This is a very important program. It is one of those that we want to emphasize, the SPRO and the basic research, the two programs I have often said we want to put more emphasis on as a Department.

Mr. MURTHA. So you have a long-term commitment to the SPRO program, is that what you are saying?

Secretary EDWARDS. Absolutely.

### STRATEGIC PETROLEUM RESERVE (SPR) BUDGET

Mr. DICKS. Would the gentleman yield?

If you have a long-term commitment, why are you reducing the budget by a billion dollars at a time when the price of oil is down? Isn't this the time to buy oil, not cut back our effort, Mr. Secretary?

Secretary EDWARDS. We should have bought it back when it was $13 a barrel.

Mr. DICKS. Now, the price is going down again.

Secretary EDWARDS. We are taking that into consideration, and we have long-term orders already in place. I think we have got a well-balanced Strategic Petroleum Reserve program. I am not saying we do not have problems with our program, but I think it is what I wanted to do, increase the fill rate early, and after we get a good nest egg in place I will feel more relaxed about stretching out those latter years. So at the same time we are asking for a postponement of the 750 million-barrel goal from 1989 to 1990, we are increasing the fill rate significantly up through 1986.

Mr. DICKS. I notice you have requested only $2 billion for SPR oil acquisition funds at a time when the price is low, which I have to question. You also propose to defer $52.6 million of fiscal year 1982 budget authority for the Big Hill storage site. At a time when storage capacity is limited, why aren't you seeking to expand our storage capacity and purchase cheap oil? Wouldn't this save the taxpayers of the country money in the long run?

Secretary EDWARDS. I do not think anybody can predict what the price of oil is going to be. We have increased the fill rate as the price went down. We have grown from 101 million barrels to 250 million barrels in a little over a year, 14 months, so we are, in fact, doing exactly what you said we should be doing. For the out years, we are increasing the leach rate at Bryan Mound to accelerate it up through 1986, and at the end of fiscal year 1986 we should have 538 million barrels of storage capacity. At the end of fiscal year 1983, if we go as planned, we will have 343 million barrels of storage capacity and we will have the available storage filled.

## BIG HILL DEFERRAL

Mr. DICKS. Why are you deferring $52.6 million on the Big Hill storage site?

Secretary EDWARDS. We are just trying to balance the ability to handle it versus our ability to build it. It takes time to build these things, and we felt it was better to increase the leach rate up front—in other words, we are filling early and postponing the completion from 1989 to 1990 by 1 year. It makes sense to me to get more in early. Then when we get say 600 million barrels, we can relax a little bit because we have a nest egg to fall back on in case of disruption.

Mr. DICKS. It is hard to understand how deferring additional storage capacity is a step in the right direction.

Secretary EDWARDS. Let me just give you a copy of my chart here that will give you some idea of what we are doing. We are accelerating up through the end of 1986. I am going to draw a line so you can see our fill schedule there. You notice that—we are increasing the leach rate at the Bryan Mound facility so that we can add more oil in early on, and we are postponing the Big Hill facility and it starts having an effect in 1987, a slowdown in 1987. If you notice, after fiscal year 1987 we will have about 600 million barrels in storage.

Mr. DICKS. How many days would that last the country in a crisis.

Secretary EDWARDS. It is hard to say.

Mr. DICKS. Don't you think we should know?

Secretary EDWARDS. What is a crisis?

Mr. DICKS. What if we have a complete cutoff of oil? How long would 600 million barrels carry us?

Secretary EDWARDS. We are importing 4 million barrels a day, so divide 4 into 600 million. I might point out that I cannot visualize—even if the Middle East were cut off, we still have alternate sources of oil that we have to fall back on. I cannot imagine——

Mr. DICKS. The whole world would be falling back on those sources if we had a true cutoff caused by a war in the Middle East. There is a great deal of uncertainty in this area and I don't think that Defense Secretary Weinberger and Mr. Haig believe that an oil cutoff would be no problem.

Secretary EDWARDS. I do not want to be quoted as saying there is no problem.

Mr. DICKS. The reason we wanted a SPRO was to protect ourselves——

Secretary EDWARDS. In case of disruption. You have Venezuela, Mexico, the North Sea—you have all sorts of alternatives—I just cannot visualize a complete cutoff.

Mr. DICKS. The cutoff price would be higher than if we had purchased oil for the SPRO now during the time when there was cheaper oil available. The chart you gave me says here that the Big Hill delay decision was not one that you and the Department wanted. This was one that was first proposed in the OMB passback and was not appealed. If we need extra capacity for the SPRO, why didn't you recommend that we go forward with the Big Hill storage site. Why didn't you appeal that decision?

Secretary EDWARDS. You know, every time that you have a program you have to balance it off versus the need to cut down that deficit, and while you are struggling to cut down the deficit, you are trying to design a program that will fulfill our needs as best we can figure them out, and also cut down our deficit as much as we can, so it is always a balance between what you want to do if you had all the money you wanted, versus what you should do and still try to bring about the economic recovery.

### SPR IN NATIONAL SECURITY

Mr. DICKS. When you step back from the budget you see a proposal to increase our defense spending dramatically because of national security needs. It seems to me that the SPRO, even though it is not funded in the Defense Department's budget, is a critical part of our overall defense strategy and will enable us to deal with various international contingencies. With national defense such a high priority, I do not understand why so little has been requested for the SPRO by this Administration. It just does not seem to be consistent with our overall effort to improve our defensive and strategic position in the world. I think this is a mistake. We can buy oil for the SPRO this year at a much lower price because of the international oil glut and in my view, we should be accelerating this program if we are really concerned about our overall national security position.

I want to move to another item.

Secretary EDWARDS. We are accelerating the fill rate in the early years while the price is low.

Mr. DICKS. You could do better if you had another billion dollars for the SPRO, in my judgment.

Secretary EDWARDS. I really do not think it would be one of the priority expenditures—if we can do it the way we are doing it, I do not think at this stage worrying about what we are going to do beyond 1987 is as important as building it up now in the near years.

Mr. DICKS. If you had another billion dollars in fiscal year 1983 couldn't you build the SPRO up at a faster rate?

Secretary EDWARDS. No question.

Mr. DICKS. That is the point. I think this should be part of our overall defense strategy.

Secretary EDWARDS. I would like you to reflect on something. We have a greater private sector reserve of oil than we have had in the previous cutoffs.

Mr. DICKS. Could you give us numbers for the record?

Secretary EDWARDS. We estimate between 200 and 400 million barrels is what they have in the private sector which could be made available for use in a supply disruption.

Mr. DICKS. That is up from where?

Secretary EDWARDS. In reserve, up to 400 million barrels in reserve today in the private sector. We also have—in our International Energy Agency Nations we have a 90-day supply in most of those countries. Some of them have greater supplies than that built up, a 120-day supply, some of them. When you balance all this off together the strain is not totally on the SPRO. Before when we had the disruptions, none of these Nations had any reserves to amount to anything. The private sector had very few stocks put aside. We had none. So you see, we are so much better off than we were from the previous times that we had the disruptions that——

Mr. **Dicks**. We just want to keep making progress, Mr. Secretary.

Secretary **Edwards**. I do, too.

### FUSION MATERIALS IRRADIATION TEST (FMIT) FACILITY

Mr. **Dicks**. I want to get to one other matter that I am concerned about. I know that you are familiar with the fusion materials irradiation test facility at Hanford, Washington. As you know, this is the only FMIT facility in the free world. How can you justify not funding this facility when three panels of experts have testified that there is a strong national need to proceed immediately with the fusion engineering development and materials testing programs?

Secretary **Edwards**. There are a lot of concepts that have to be proven before we move into the engineering aspects of it. And this is an area of endeavor that is far over my head, but Dr. Trivelpiece, who is a recognized expert, is my Director of Energy Research, and he is the one that made the final determination as to where we should spend our money. But basically the engineering will follow later on. We have some concepts that just have to be developed, materials development and that type of thing, before we move ahead into the engineering aspects.

Mr. **Dicks**. We know that it is important, Mr. Secretary, but we do not understand how it can be important if you are cutting off all the money for it. It does not sound too important if you are terminating the program. Our colleague, Congressman Morrison, is very worried about this.

Secretary **Edwards**. You mean the FMIT?

Mr. **Dicks**. Yes.

Secretary **Edwards**. We do not have any money in 1983. We have some money in 1982, and we are going to continue the design of the FMIT. Design will be essentially completed, but no further construction funds will be requested until sufficient funding can be made available. We are working with the Europeans and with the Japanese as possible joint partners in this effort. So it is not as though we have completely terminated this project. Fusion is a program which is 40 or 50 years away from supplying a significant portion of our energy needs. At a time when we are having financial problems trying to balance the budget, I feel like this is an area where we can cut back some. We are putting, as I recall, $444 million in fusion, in the fusion program totally, so it is not as though we are completely forgetting about fusion. In fact I think it is very adequately funded at a time when we are having some severe economic problems at home.

Mr. **Dicks**. The DOE's Fusion Committee in 1979, the Fusion Advisory Panel in 1980, and DOE's panel chaired by Dr. Buschbaum in 1980, all testified that fusion was essential and that a fusion engineering device was feasible by 1990 with sufficient assistance from the Government or the private sector. Many of us are very

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concerned about this decision, and we intend to talk to you some more about it.

I have one further question I would like to ask.

Secretary **Edwards**. I would like very much to get Dr. Trivelpiece to go over this with you.

Mr. **Dicks**. Is he here?

Secretary **Edwards**. No, but he is the one in charge of this program, and he can explain very well what his plans are in this area of endeavor.

### COMPLIANCE PROGRAM FUNDING

Mr. **Dicks**. The Congress had to take the initiative in fiscal year 1982 to maintain adequate resources to pursue alleged pricing violations during the period of price controls on oil. Now in fiscal year 1983, you have again sought to virtually eliminate this program. What is your current assessment of the potential alleged overcharges?

Secretary **Edwards**. Well, I certainly have no way of deciding what the alleged overcharges will be. We have $33 million in the program this year, in 1982, and we are in the process of completing our audits. We hope to have all the audits completed. We also——

Mr. **Dicks**. How are you going to do that when you are proposing to cut off all the money for the program?

Secretary **Edwards**. We have not cut off all the money for the program. You can only do so many audits. We have completed the audits in most areas, particularly for the large refiners. We are now in the process of trying to negotiate these settlements. We have gone on record as saying we would like to negotiate the settlements, and we hope to have this all completed by September 30. We will move into litigation in 1983. We have $14 million requested in our compliance budget, as I recall, $4 million in hearings and appeals, and I think $2 million for administration, which gives a total of about $20 million, and we hope to turn those over to the Department of Justice for prosecution or litigation in 1983. So we are moving aggressively ahead in the program.

Mr. **Dicks**. It has been estimated that there was potential of recovering $10 billion. What are we going to recover, Mr. Secretary?

Secretary **Edwards**. I think the previous administration recovered about 13 cents on the dollar that they had claimed were violations against major refiners and I would certainly hate to estimate at all what we will recover. I would like to leave that up to the courts to decide, because there are a lot of alleged recoverable costs here that I think are not going to come to fruition when you are talking about $11 billion or $12 billion, $15 billion of alleged overcharges. As you go down and review some of these overcharges, they do not hold up in court, so it will be much, much less than the amounts that have been alleged in collectible, usable funds.

Mr. **Dicks**. So you are not prepared to make any estimate about how much of these overcharges can be recaptured?

Secretary **Edwards**. I would rather try to recapture as much of it as possible by trying to settle them or, taking them to court and after it is over add them up and then we can talk about what it was.

Mr. MURTHA. Could you tell us of the $71 million available in 1981, how much was obligated for compliance?

Secretary EDWARDS. In 1981?

Mr. MURTHA. Yes.

Secretary EDWARDS. We had $71 million budget authority in 1981. I do not know how much we have used.

Mr. MURTHA. We have a figure that $7 million was lapsed. Is that accurate?

Secretary EDWARDS. We will have to check on that and supply that for the record.

Mr. MURTHA. Would you also give an answer of why this money was not spent?

Secretary EDWARDS. We would be glad to.

[The information follows:]

### COMPLIANCE FUNDING LAPSE

Over 95 percent of the $7 million lapse that occurred in fiscal year 1981 compliance funding was in payroll and other personnel support funds. The $70.9 million in budget authority had been appropriated to support 1,305 staff years of effort. Due to attrition, only 1,115 staff years were used.

### COMPLIANCE PROGRAM

Mr. MURTHA. Mr. Dicks?

Mr. DICKS. Mr. Secretary, are you telling us that you are going to pursue this vigorously? I think you realize that there is some concern about whether this Administration, with its ties to big business and big oil, is really going to vigorously pursue this matter. You told us last year that you would, but we see budget cuts, and money that is not spent. Are you prepared to tell us that you are going to pursue this matter vigorously this year? We are trying to reduce the deficit. If we could collect some of this money, would that not help?

Secretary EDWARDS. To start with, I want to challenge the statement that we are tied up so closely with big business and big oil. I would like you to look at the earnings of big oil under this Administration and big oil under the last Administration. I think forcing the big and little oil companies to go back into the private sector and compete among themselves shows a decrease in the bottom line of the big oil companies. So to say we are in bed with——

Mr. DICKS. I did not say you are in bed with them. I said some people are concerned about whether you are going to enforce the law. When we hear about negotiated settlements, people get suspicious. I would like to hear you say that you are going to vigorously try to recapture this money.

Secretary EDWARDS. I do not know how I can say it any other way. The previous Administration negotiated more settlements than they took to court and got more money out of those than those they took to court. You do better by negotiating than spending the money to take the things to court. The lawyers are the only ones getting rich when you take them to court. Not being a lawyer, I am not too interested in that. We will prosecute these cases every way I know how. I just reviewed them before you came in. All audit work is completed on 21 of the 35 refineries.

Mr. DICKS. When will the other 14 be completed?

Secretary **Edwards**. We are negotiating with the remaining 14 now, and hope to settle by September 30. The crude oil resellers are the largest group of unfinished cases, and settlement discussions are going on with many of these. We hope to settle most of these cases by September 30.

Mr. **Dicks**. How have we done on the 21 that we have settled?

Secretary **Edwards**. The previous Administration I think collected 13 cents on the dollar in their negotiations with major refiners.

Mr. **Dicks**. Did you do better?

Secretary **Edwards**. I hope so. I do not know. We have not checked it but we will check and see.

[The information follows:]

### Major Refiner Settlements

Approximately $605 million has been collected from major refiner settlements announced to date including 18 global settlements. Three additional settlements have been reached with major refiners, but details of these have not yet been announced.

Secretary **Edwards**. We have about 250 crude oil resellers cases, and these are behind the other categories. We are taking enforcement actions and hope to complete these in fiscal year 1982. We hope all the auditing will be done, and if we can negotiate a settlement, that will be done. If we can't, we will take them to trial in 1983.

Mr. **Murtha**. Will you need additional funding if these are not completed?

Secretary **Edwards**. We have $14 million set aside for this, plus $4 million for hearings and appeals and $2 million in administration. That comes to $20 million.

Mr. **Murtha**. $6 million above the $14 million?

Secretary **Edwards**. No. We have $14 million; that should be sufficient in the compliance area.

### PERSONNEL

Mr. **Dicks**. Your budget proposes to cut 4,000 people out of the Department of Energy. Is that going to undercut your ability to move forward on this enforcement effort?

Secretary **Edwards**. No. Now that the audits are almost all completed, we do not need to keep the auditors around too much longer, so we hope to get rid of them. Now we are bringing the lawyers on.

Mr. **Dicks**. Could you give us a profile of how many people were working in this area in fiscal year 1981, how many are working there now, in fiscal year 1982, and how many there will be left in fiscal year 1983?

Secretary **Edwards**. I think we can give you that. We had 1,149 in 1981 full-time equivalents in compliance. In 1982 we have dropped down to 485; they are to be supplemented with 74 additional FTEs at some point during the fiscal year. And in 1983 we hope to drop that down to 263. As the cases are settled there is no need to keep these people around twiddling their fingers while the rest of the cases are settled.

**Mr. Dicks.** I hope the voluntary approach works. It looks like you are not going to have too many people left to pursue the oil companies.

**Mr. Murtha.** The gentleman from Ohio.

### MINING R. & D.

**Mr. Regula.** Thank you, Mr. Chairman.

Mr. Secretary, the United States has probably the worst record of any coal-producing nation in recovering coal. As I understand it, there is about 50 percent left in the ground. My question would be, Why are you reducing the mining R&D budget rather drastically when possibly research could get more coal out of the ground and therefore would be very cost effective?

**Secretary Edwards.** We had planned to put all of the mining R&D back over in the Department of Interior, and we have $1 million, I believe, as I recall, in mining R&D, and possibly Mr. Mares here, who is Assistant Secretary for Fossil Fuel, might be able to take that tough question and answer it better than I.

**Mr. Mares.** There have been a series of contract research programs under way with in-house research capability at the Bruceton site. There is a unique capability there, and the expectation is that by the transfer of that capability to the Department of the Interior—the reason for that is because they are worried about mine safety, and we have been worried by productivity, and you cannot worry about one without the other. Everybody agrees that that integration is very important, and we are hoping to encourage that transfer even before the beginning of fiscal year 1983.

**Mr. Regula.** You are really suggesting that the overall commitment to the research and development will remain, although in some different form, i.e., Interior and in-house?

**Mr. Mares.** That is correct. In the context of our 1983 budget we still have the responsibility for mining, because it has not yet transferred to Interior, and we thought it was sufficiently important. There are some things we had zeroed out as we discussed earlier, but this one we do think is important, albeit at a lower level. We want to transfer it as soon as we can to Interior.

**Mr. Regula.** At this point there is no money in the Interior budget?

**Mr. Mares.** No. That is why there is money in ours. It is not cricket to transfer it to somebody else with no money.

**Mr. Regula.** Do you think what you have is adequate?

**Mr. Mares.** In the context of our total research budget, looking at the particular program already under way, we think that is adequate; yes, sir.

### NATIONAL REGULATORY RESEARCH INSTITUTE

**Mr. Regula.** As you know, Congress intended that $1.2 million be made available from fiscal year 1981 Economic Regulatory Administration for the National Research Institute. Because the conference report was not signed into law until after the start of fiscal year 1982, funding for this program had lapsed. It is my understanding that you allowed $16 million of fiscal year 1982 funds for the Economic Regulatory Administration to lapse. What was the part of the total budget unspent, and secondly, given the congressional intent to fund the NRRI, do you intend to seek a reprogramming to provide funding in fiscal year 1982?

Secretary **Edwards**. I will have to check on why that money was unspent. We will submit that answer for the record.

[The information follows:]

### Economic Regulation Funding Lapse

The fiscal year 1981 appropriation funded 2,022 staff years but only 1,515 staff years were utilized in the Economic Regulatory Administration due to attrition. This resulted in a lapse of $11.2 million. Another $4.2 million lapsed pursuant to the decision not to fund discretionary grants and cooperative agreements under the State Utility Regulatory Assistance section (Subtitle E) of the Public Utility Regulatory Policies Act of 1978, and Title 2, the Electric Utilities Rate Design Initiatives section of the Energy Conservation and Production Act of 1976.

Secretary **Edwards**. I regret that the funding lapsed before money was obligated for the program. Potential sources are being reviewed within the Department to determine if funds are available for the final year of the grant. I understand ERA took steps to extend the grant period of performance so that we have the vehicle to take care of this. If the funds are located and reprogramming action is required, we will submit this to Congress.

Mr. **Regula**. You are suggesting that you are diligently pursuing an effort to reprogram?

Secretary **Edwards**. Pursuing. I do not know how diligent it is.

Mr. **Regula**. I suggest that it be diligent.

### OIL IMPORTS

OPEC is cutting back on oil production in order to maintain the current price level, at least that is what we read in the papers. It would seem that they could raise the price of oil just as easily. What would be the Department of Energy's response to the oil glut? Do you have a concern that we will fall away from our efforts to become more energy independent in the face of lowered prices and then suddenly the price would shoot up again?

Secretary **Edwards**. If I understand you, I think that we are getting ready to go through the same cycle we have been through before. Before you came in, I mentioned a couple of words on this, that I have mixed emotions about the falling price of oil, because as the price falls of course our consumers are getting a better deal, and we should all be happy. But on the other hand, as the price falls, there is not going to be that driving force to explore and discover new sources of oil, to develop synthetic fuels, alternate sources of energy. There will not be that driving force to conserve, and we are conserving tremendous amounts. This last 4 weeks we are at an all-time 10-year low as it relates to importation of crude oil. We imported 4 million barrels a day for the last 4 weeks.

Mr. **Regula**. How does that compare to our peak?

Secretary **Edwards**. The peak was 8.7 million barrels per day in 1979, so we are lower than 50 percent below peak. What is going to happen is we are going to lose that driving force, or may, and we will relax, and then all of a sudden there will be some disruption, and once again the spot market will rise, the OPEC prices will rise, and we will be back into another cycle.

Mr. **Regula**. We want to avoid being lulled to sleep because of this particular situation, and I am concerned that we move forward with alternative sources even though they are not as critical today as they might have been when we were importing 8.7 million barrels per day.

Secretary **Edwards**. It is good to see that some of the things are working, however, and I hope they will continue to work. It is interesting to note that at one time OPEC produced 30 million barrels a day, and now it is producing 20 million barrels. They have lost a third of their market. A lot of people think that OPEC nations can reduce their production and control the price. I am not sure that it is possible for them to do that. Saudi Arabia and other countries have gotten used to the good life, and they have to keep up a certain production to maintain their good life at home for political stability, and I think it is something that we have to all think about. As the price falls, they are not going to have that income at home to maintain the happiness of the people, and there will be unrest and instability in those various countries that already lack stability, and of course our real enemy always takes advantage of a situation like that and comes in and stirs the pot. I think we have to address ourselves to what is going on in the energy field today. As we rejoice in the fall of the price, I think we ought to be concerned about these things.

Mr. **Regula**. You mentioned 8.7 million barrels per day as a maximum and 4 million barrels a day as the current rate of import. We have heard about the full-employment budget. Do you know what the increased import flow would be if we were to have, as it is described in the economic world, a full-employment economy?

Secretary **Edwards**. I am sure that there would be some increases, but there will be some offsetting activities. If you think for a minute about it, there are I think about 10 million of those gas-guzzlers left around, as I recall.

Mr. **Regula**. I have one.

Secretary **Edwards**. As the economic situation improves, that means that interest rates will fall. As interest rates fall, people are going to be borrowing more money to buy new cars, and as they buy new cars they will get cars that are more energy efficient, so you will get rid of a million gas-guzzlers a year. You will have offsetting economy measures at the same time you have the economic speedup. I have not done a study to see, but it will be that great an increase.

### NATURAL GAS DEREGULATION

Mr. **Regula**. Following up, in the reduction in demand because of conservation in oil, what is the status of the Administration's position on natural gas deregulation? Do you anticipate submitting anything, in the near future, that would, in any way change, the terms of the Natural Gas Act of 1978?

Secretary **Edwards**. Yes. This Administration is totally committed to getting the Government out of the marketplace. I think that the congressional leadership convinced the President that with the economic problems that we are having today and the other problems we have that we have got enough to do without having to throw natural gas deregulation into the legislative pot this year. Just because the President decided not to put it in this year does not mean that he is not committed to it because he is very much committed to the deregulation of natural gas.

I think it is one of the things that we need to do. We should do it. There is never a good time to do it but I think probably the President was right in not doing it this year.

I think he is probably the best of anybody I have ever seen in the political arena but I think at an appropriate time he will move to deregulate natural gas.

At one time, I was deeply concerned about what political effect deregulation of natural gas would have but after we did our in-depth study, I was no longer too deeply concerned because the price is not going to go up that much more than it is going up ordinarily because under the NGPA we deregulated more expensive categories of gas.

For example, the gas under 15,000 feet today is selling for up to $10. Whereas, under our proposed deregulation, al the gas would wash out, basically at about $4.70 in 1980 dollars.

Our studies showed that the residential price is going up in real terms about 10 percent annually. Under our accelerated deregulation plan it would go up about 13 or 14 percent in real growth annually.

But, in addition to that, if we continue NGPA—like pricing beyond 1985, our production of natural gas is expected to decrease by 19 percent by the year 1990. If the NGPA is allowed to run its course, production will decrease by 13 percent from now to 1990.

Mr. DICKS. Production of natural gas?

Secretary EDWARDS. Yes. Under the present NGPA, production of natural gas will decrease 13 percent by 1990.

Mr. MURTHA. Is that domestic production?

Secretary EDWARDS. Yes, lower-48 gas production. Some studies show under accelerated deregulation there would be a 9 percent greater production than that figure.

Mr. DICKS. So it would only be a 10 percent reduction?

Secretary EDWARDS. That is right, under accelerated deregulation, it would be basically that, yes, about a 10 percent reduction.

Mr. DICKS. Will my colleagues yield on this point just for a moment?

Mr. REGULA. Yes.

Mr. DICKS. When you say under accelerated deregulation the Administration has decided it does not want to do that.

Secretary EDWARDS. That is right.

### WINDFALL PROFITS TAX ON DEREGULATED GAS

Mr. DICKS. If the Administration changes its mind would it favor gas decontrol coupled with a windfall profits tax?

Secretary EDWARDS. Not according to this Administration, no, we would certainly not send the bill over with that recommendation.

The President is completely against the windfall profits tax and I think rightly so.

Mr. Dicks. Many people have suggested you could generate $10 to $20 billion in revenue this way. Even Mr. Volcker mentioned this in a meeting that I had with him. He mentioned that one possible way to reduce the deficit would be to go ahead with an accelerated program of gas deregulation and a windfall profits tax.

Does the Administration agree with this proposal?

Secretary Edwards. The Administration is on record as being against the windfall profits tax.

Mr. Dicks. But didn't you suggest that others might want to send such a proposal to the Department?

Secretary Edwards. I am not suggesting anything.

Mr. Dicks. As I recall there were certain commitments made to a number of my colleagues at the time the Gramm-Latta Reconciliation matter was under consideration.

Wasn't a recommendation made to Congressman English that there would not be any windfall profits tax if there was accelerated deregulation?

Secretary Edwards. The President said he would veto it with pleasure.

Mr. Dicks. That is still the Administration's position?

Secretary Edwards. That is absolutely the Administration's position.

Mr. Dicks. Thank you.

## SYNTHETIC FUELS

Mr. Regula. One last question for you, Mr. Secretary. You mentioned about the diminished concern we have in terms of fossil fuel supply. What do you see as the future of the synthetic program? Is there a danger that we will slow down in our efforts to develop synthetic fuel and thereby make ourselves vulnerable again, to a large demand for fuel?

Secretary Edwards. Let's just start off from the top just to sort of put things in proper perspective. It costs about seven or eight times as much capital investment to develop one barrel of production a day of synthetic fuels as it does in conventional fuels. So you see the problem. Nobody is going to invest money in synthetic fuels if they can invest money in conventional fuels and the price is the same. So it is just an economic situation that you are not going to have that driving force. So I am delighted that we do have some situations in place.

I thought we were doing the right thing when we fought so hard to get our three synthetic fuels programs approved: the Union project and the Tosco project and then the Great Plains coal gasification project. I thought then it was the right thing to do and with the decrease in the price of oil today, I think it was even more important that we got them underway.

The Synthetic Fuels Corporation, I think, is charged with a grave responsibility to get some of these technologies in place because sooner or later we have got to move into that area of endeavor.

We have got billions of barrel-equivalents of oil in our shale products out West. In coal, for example, if the Great Plains gasification project proves satisfactory, and from all evidence it looks like it is going to be a satisfactory project, we can take from that one technology alone, one-half of all the different types of coal in America and convert them to a pipeline quality gas in an environmentally acceptable way and place it in the infrastructure that we already have in place.

Mr. **Regula**. One-half of the coal reserves?

Secretary **Edwards**. Of all the types of coal that we have in America which is an unbelievable supply and it will really do an awful lot to fulfill our energy needs in the years to come. So, I think synthetic fuels is one of those things that we have just got to push ahead on and that is one area, I think, that the Government just has to get in and push forward, either in loan guarantees or product purchases like we did with the Union project and the Tosco-Exxon Colony project. But we have got to move ahead.

That has great potential for solving our liquid problems in future years, those two technologies.

Mr. **Regula**. In the interest of time I would reserve some questions for the record to be submitted to the Secretary.

[Committee note.—The questions and answers are on page 222.]

### ANTHRACITE COAL PROGRAM

Mr. **Murtha**. Thank you. Mr. McDade, who is over on the Defense Subcommittee, is concerned about the report this committee directed DOE to prepare on the status of your anthracite coal program. What is the status of that report?

Secretary **Edwards**. As you know, we have a very viable long-range, high-risk research in anthracite coal. This program has to do with mining and combustion techniques. We have been developing new ways to burn it in atmospheric fluidized bed techniques.

In fiscal year 1982 we had $1.8 million from a previous contract in this area that we had terminated. We had $1.4 million, so together we will have about $3.2 million available to design and install and operate the anthracite coal project in Wilkes-Barre and I think that is the one he is interested in.

Mr. **Mares**. We continue to pay attention to the anthracite coal. I believe the report that was referred to, the due date has not yet occurred.

Mr. **Murtha**. But where is the report about the Office of Anthracite Coal? That is what Mr. McDade is concerned about.

Mr. **Mares**. My recollection is the due date for second quarter has not yet occurred.

Mr. **Murtha**. If you will address yourselves to it.

[The information follows:]

### Status of Report Regarding Office of Anthracite Coal

The Conference Report on the Department of the Interior and Related Agencies Appropriation Bill, 1982 (H.R. Rep. No. 97-315, p. 27 (1981) required the Department of Energy to report to the House and Senate Appropriations Committees within 90 days of the enactment of the appropriations bill as to the implementation of anthracite coal programs.

At the present time, the report entitled "Implementation of Anthracite Coal Projects and Programs", is undergoing final Departmental review and is expected to be submitted to the appropriate committees by March 23, 1982, as required by the Conference Report.

Mr. **MURTHA**. Mr. Dicks.

### NORTHERN TIER PIPELINE

Mr. **DICKS**. Mr. Secretary, as you know, there has been a great deal of interest in the Administration's position on the Northern Tier pipeline. As we understand it, the Administration has had discussions with the Governor of our State, John Spellman, about Northern Tier.

Secretary **EDWARDS**. I think that is a misconception because he refuses to discuss it.

Mr. **DICKS**. Did you ask him to discuss it?

Secretary **EDWARDS**. Yes, we requested a meeting with him.

Mr. **DICKS**. What is the Administration's position on Northern Tier?

Secretary **EDWARDS**. Well, we feel that it is absolutely essential to get that pipeline built. You can save about 25 percent of the transportation costs transporting that oil from Alaska down to where you can reach about 30 percent of all the refineries in America in an area that is hard to reach with product.

So, we are, from a national security standpoint, if you just can visualize in times of war, for example, defending that supply route from Valdez all the way down the West Coast, through the Panama Canal across that pipeline that is being built at the Panama Canal, up to refineries in the Gulf area. You can just visualize the national security risks there vis-a-vis trying to protect the line from Valdez down to the State of Washington. So, from a national security standpoint it makes sense. From an economic standpoint it makes sense to build that pipeline. And the company, I understand, has been willing to make some concessions and redesign it, move it to fit the needs of the State of Washington. I hope that the pipeline can be built.

Mr. **DICKS**. As you know, the Energy Facilities Site Evaluation Council out there, EFSEC, has recommended against building the pipeline. The Governor has yet to make a final decision under Washington State law.

If the Governor should go along with the EFSEC decision, will it be your position that the Federal Government should seek legislation to pre-empt the State of Washington's decision and to direct the building of the pipeline?

Secretary **EDWARDS**. I hope that the Governor will see the need for it. All the remaining Governors, I think there are eight Governors that that pipeline affects, eight States. All those eight Governors have gone on record as being in favor of it. They have offered to build a fund to offset any possibility of environmental damage that could possibly be caused to the State of Washington.

They have done about everything you can do to try to convince the Governor that it is in the best interest and is much needed.

Mr. **DICKS**. So, you are not ruling out the possibility of pre-emptive legislation if the Governor should go along with the Siting Council's recommendation?

Secretary **Edwards**. That certainly is not my suggestion. That was yours, not mine.

Mr. **Dicks**. But you are not ruling it out?

Secretary **Edwards**. I would certainly not rule it in or out. I have no feelings. I have not given it that much thought. I hope it can be settled by the Governor.

Mr. **Dicks**. I am just curious is the pre-emption option under consideration?

Secretary **Edwards**. It certainly is not under consideration by me but I have been told that about 70 percent of the people polled out there are in favor of that project being constructed.

Mr. **Dicks**. But if this project is so important to the Administration, would it consider legislation to pre-empt the Governor's decision if it stopped the project?

Secretary **Edwards**. I really have no ideas. I have not thought about that aspect and I am not going to give you an answer until we look at it and study it.

Mr. **Dicks**. Well, would you give us an answer for the record after the Governor makes his decision?

Secretary **Edwards**. After the Governor makes his decision?

Mr. **Dicks**. Right. Would you let this committee know?

Secretary **Edwards**. I think the action will probably explain that situation, the action we take afterwards, but I will be glad to look at that as a possibility if you're suggesting it and give you my ideas of what I think the possibilities are.

Mr. **Dicks**. I am not urging that. I think I appreciate your answer, but I am not sure I fully understand it.

[Committee note.—At the time the hearing record was closed, May 12, 1982, the information as to the Administration's position with regard to the Governor of Washington's decision on the Northern Tier Pipeline had not been received. When it is received, it will be retained in the committee files.]

### NORTHERN TIER PIPELINE

Mr. **Dicks**. There is a belief that the Administration is putting a lot of pressure on the Governor. I guess we will have to wait and see what his decision is.

Secretary **Edwards**. The Governor is sitting as a judge and I hope that the judge will hear all of the testimony before he makes his final decision.

Mr. **Dicks**. Should the Governor sit down with you and the Secretary of Defense and listen to your national security arguments? Has he been unwilling to do that, is that what you are saying?

Secretary **Edwards**. That is exactly what I am saying, yes. If I were a Governor of the State and a member of the Cabinet ever called me and said, "Jim, I would like to sit down and talk to you about this project in your State," I would welcome sitting down across the table. I will listen to anything and talk to anybody. But when two or three members of the President's Cabinet, particularly of his own party, have been asking for a meeting to talk about the importance of this to the national security and the economic well-being of the Nation—

Mr. **Dicks**. You think he is wrong not to meet with them?

Secretary **Edwards**. I think he is wrong, yes.

### ENERGY IMPACT OF MASS TRANSIT FUNDING CUTS

Mr. **Dicks**. As you know, there have been major cutbacks in the budgets for mass transit operating subsidies. That is not in your budget but it certainly does have an energy saving impact. Does your Department take a look at what the possible effects of a cutback in the Federal Government's mass transit program might have on energy supplies.

Secretary **Edwards**. I am sure somewhere we have a study on that. We have studies on just about everything you can imagine in that area, but I don't know of any specifically.

Mr. **Murtha**. Just so you have a study on anthracite coal.

Secretary **Edwards**. We have that, yes.

Mr. **Dicks**. If you can put that in the record, we would like to have that.

[The information follows:]

### Energy Impact of Cuts in Funding for Mass Transit

The attached DOE Technical Memorandum reviews alternative policies to stimulate energy conservation in the urban transportation sector. It concludes that subsidy of public transportation is the least effective policy to conserve energy among those considered. On page 60 the study concludes, "further increases in an already considerable program of Federal support to urban public transportation for the purpose of energy conservation can not be justified." DOE has not specifically analyzed the energy impact of the Administration's proposed 7 percent reduction in urban discretionary grants and 22 percent reduction in urban formula grants (fiscal year 1982 to fiscal year 1983). However, DOE is confident that the energy impact of these reductions would be insiginficant.

[Committee note.—The Technical Memorandum will be retained in the committee files.]

Mr. **Murtha**. Mr. Secretary, if you would answer some questions for the record the committee will not meet this afternoon.

Thank you very much.

Secretary **Edwards**. Mr. Chairman, you are a gentleman and a scholar and I appreciate your courtesy, thank you.

[The information follows:]

## Synthetic Fuels Corporation

Question: Does the Administration have plans to broaden the authority of the Synthetic Fuels Corporation?

Answer: No. Congress has given the Synthetic Fuels Corporation sufficient authority to carry out its mission of providing incentives that will allow private industry to build and operate synthetic fuel facilities. The Administration recognizes the value of initial production efforts and the importance of providing support for a technologically diverse portfolio of projects. To broaden this authority by giving the SFC the responsibility to provide direct Federal subsidies for synfuels development would be inconsistent with the President's Program for Economic Recovery. That Program called for "sharp reductions in direct Federal subsidies for synfuels development . . . ." not only for reasons of fiscal austerity but also in recognition of the proper roles of government and industry in choosing which technologies should be brought to market and in assuring the risks of commercial development efforts.

Question: Haven't you left a gap between the long-term research you do support and seeing that research reach a usable form?

Answer: The Federal research effort has been realigned to concentrate on generic and technology base research and away from support of near-term, specific proprietary processes. The issue here is the proper role of Government versus the private sector. Once the technical groundwork is in place, difficult and complex decisions must be made as to whether the technology in question can be built on a commercial scale and be competitive with alternative technologies. These decisions and the research needed to support them are the responsibility of the private sector. It is a responsibility that they have traditionally and successfully carried out in the petroleum and chemical industries and we see no reason why a truly healthy synthetic fuels industry cannot be developed in a similar manner. For commercial development efforts, the Federal role is properly limited to the activities of the SFC, where the emphasis is on reducing market risks, as opposed to technical risks, associated with initial development efforts.

## Energy Research Advisory Board R&D Priorities Report

Question: Most of your strategy is to rely on the private sector and market forces. Yet, there are many voices that point out flaws in this approach. For example, the Energy Research Advisory Board in its November 1981 report on research and development states that it "is concerned that some energy R&D of great potential significance for the achievement of the Nation's energy goals will fall between Federal and industrial responsibilities." The report goes on to state that some energy markets are not free, some elements are too fragmented, such as the building industry, and for others, while the motivation exists, the capability does not exist.

--First, could you please briefly explain what the Energy Research Advisory Board is with a general description of its members and then explain your response to these statements of the Energy Research Advisory Board?

Answer: The Energy Research Advisory Board is the highest level independent scientific advisory committee serving the Department of Energy. It provides me and the Department access to the scientific and engineering community, and advice on a broad range of energy research and development issues. It is chartered under the Federal Advisory Committee Act, and currently has 21 members. They are individuals who are preeminent in their fields, and are selected so that the Board is balanced in terms of areas of knowledge, background, type of institutional affiliation, and so on. They are private citizens, many at the university or corporation president or vice president level, who serve without compensation other than travel expenses.

With respect to the proper Federal role in energy R&D, the Department has been as careful as possible to insure that important areas of energy R&D do not fall between the cracks in the transition from Federal to private sector support. The Board's report was helpful to DOE in focusing our attention on such potential problems and we have, in fact, asked the Board to take a closer look at these Federal role questions. Specifically, the Board is addressing this issue in greater detail with respect to our utilization of the national laboratories, Conservation, and Solar R&D, and has established panels in these areas at our request.

Overall, I believe the Board's report discusses the total context of the energy research and development scenario in an excellent manner. Clearly, the Federal Government should not and cannot support research and development on all promising technologies, especially those that are approaching the commercialization stage. Industry is an amalgam of various entities existing under geographical and regulatory conditions that do not permit it to do research and development on all promising technologies. In addition, the Federal Government has traditional unique responsibilities that relate to environmental protection, health and safety, and national security. All of these factors require careful judgments and a cooperative Government-industry dialogue. I believe the Board's report has described the problem we as a country face in this regard very well.

There are additional things we must consider as we continue to shape our energy R&D programs:

- Where programs are curtailed, we want to ensure that an appropriate transition to private initiative is encouraged; where Federal programs are continued, we want to ensure coupling and technology transfer to private firms.

- Where programs are terminated, we have determined that these efforts are not appropriate for Federal support, and, if there is an economic potential, private industry will support.

- As changes take place, we intend to maintain the Nation's core science capabilities in the national laboratories, industries and the universities. A follow-on Board panel is examining the future role of the national laboratories at my request, and I view cooperation between universities, national laboratories and industry as being a key element in an effective energy R&D program.

- We must continue to make the long-range investments in basic sciences to provide the knowledge that undergirds our future. These investments provide the basis for the creativity and innovation that are needed for our national progress.

The Department looks forward to continued advice and assistance from the science and engineering community in planning and implementing the DOE R&D program--including the Energy Research Advisory Board and various other panels and study groups. This kind of information can go a long way toward improving our ability to make wise judgments and more effectively serve the national interest through our R&D programs.

Question: If the Energy Research Advisory Board is correct, won't we be ignoring a large energy using sector?

Answer: We do not believe that this is the case. While we appreciated ERAB's viewpoint on this matter, we believe that the marketplace is beginning and will continue to provide the necessary impetus to stimulate private industry investments in energy research and development including the building industry.

It is our basic posture that the role of Government is to provide a framework, and appropriate "climate" for private action and initiative. The private sector can, and should, be free to respond to marketplace realities and be the focus of decisionmaking. In many areas, the private sector is perfectly capable of handling the development and commercialization of energy technologies. In this context, the Government should then be responsible only for those promising areas where the private sector is unlikely to make the investments that the national interest requires. This means that our energy research and development spending must be selective and targeted, and should reflect a consistent underlying rationale; that is, the Federal Government is responsible primarily for longer term research, and the private sector is responsible primarily for development, demonstration and commercialization of promising technologies.

Specifically, with regard to the buildings industry and other large user sectors as well, improving the efficiency of energy use is unquestionably important. A lot of efficiency improvements are, in fact, taking place and over the past four years the Nation's total use of energy has remained about constant. Higher prices have gotten everyone's attention.

As you know, ERAB suggested that funding by DOE in conservation programs should be increased. This reflects a differing view of how the private economy will respond to the signals given by higher fuel prices in making its conservation investments or in doing research and development on efficiency improvements. The Department continues to support the view that such decisions are best left primarily to the marketplace and that the needed research and development should be primarily left to the private sector. The question is whether this process needs to be helped along by Federal research and development. I don't think anyone can argue that such research and development would be bad for the country, but there are not many strong arguments that such Federally-sponsored programs would have much immediate impact over and above what industry will do itself. In any event, I have asked ERAB to undertake an additional study that focusses much more directly on the relative Federal and private sector roles in conservation research and development and a very able panel has been assembled for that purpose.

## Synthetic Fuels Corporation

Question: In February, after a prolonged gestation period, the Synthetic Fuels Corporation became operational. Once operational, two projects and some unobligated appropriations were to transfer from DOE to the Corporation.

Has this transfer taken place? If so, please tell us exactly what was transferred.

Answer: Since the United States Synthetic Fuels Corporation (SFC) has been declared fully operational by Executive Order 12346, the Department of Energy is proceeding in an expeditious manner to transfer the designated projects (TOSCO and Union Oil) and related unexpended funds to the Corporation.

The process of transferring projects and unexpended balances was initiated in the Department on February 8, 1982, and was followed by a meeting between the Department and the SFC on February 23, 1982. All relevant details concerning the transfer were discussed and no apparent unresolved issues remain. Pending the receipt of a legal opinion by OMB from DOE, the transfer will be concluded in the near future.

## Budget Request for Conservation

Question: The energy policy of this Administration, simply stated, is to conserve more and produce more, but when you look at the budget request there is only minimal support for conservation programs. There is no money to continue the grant programs, and less than $20 million for research to improve energy efficiency.

-- Since you have often stated that conservation is important, why is there such a small request for conservation in the FY 1983 budget?

Answer: There is very little linkage between Federal Government expenditures for conservation and conservation accomplished. Also, much more conservation can be accomplished without any further research. However, it is our intent, based on program and budget priorities, to continue R&D in those areas which the private sector cannot reasonably be expected to pursue, and which appear to have merit.

Question: You are reported to have said before another Congressional Committee that only 5 percent of the conservation effort can be attributed to the efforts of the Federal conservation program. Let's assume that you are correct. Five percent of 13 quads, which is what I have been informed is the reasonable estimate of the amount of energy that has been conserved in one year, is the equivalent of 110 million barrels of oil that has not been imported as a result of Federal energy programs. At $30 a barrel, this amounts to more than $3 billion, and in no one year have we ever spent more than a billion dollars on conservation programs. So we, in effect, are getting a fantastic payback on the amount of investments we are making.

-- With this good experience, why would you want to reduce the conservation budget so drastically?

Answer: What this says is that the Government has spent one dollar to save the private sector three. Return on investment is usually calculated on the basis of the investor reaping the benefit. It is precisely this "fantastic payback" that makes private sector investment in energy conservation so attractive. Particularly in view of the existing tax credits and other benefits, the private sector is expected to more than replace Federal spending in energy conservation.

## Industrial Energy Conservation

Question: It has been testified many times to the Subcommittee that the industrial energy conservation program has produced excellent results with approximately $50 million a year saved by accelerating the development of energy conservation technology that would have been too risky for the private sector to develop on its own. In almost all cases, these were technologies close to commercialization, but because of technical risks or the very high cost of money, were not able to be entirely financed by private concerns. This program was kept alive for Fiscal Year 1982 by the Congress, but you have proposed to eliminate it in FY 1983.

— Why is the Administration eliminating a demonstrably effective program?

Answer: While it is true that Federal subsidy can accelerate energy conservation by the private sector, it is inappropriate for the Federal Government to be making decisions for the marketplace, choices between industries to be subsidized and which not, choices as to which technologies should be advanced and which not. The 1981 tax law provides ample incentive for the private sector to undertake cost-effective research.

— What evidence do you have that the private sector will pick up these industrial energy conservation programs?

Answer: The private sector spends billions of dollars every year on research without Federal subsidy. It is too early to guage the effect of the 1981 tax provisions, but presumably Congress, in enacting the law, felt that it would provide an incentive for increased private sector research.

## Weatherization Assistance Program

Question: Through the years the Department of Energy has developed a workable low-income weatherization program that addresses a problem the market place cannot resolve. Why, then, does the Administration request that the weatherization program become a part of HUD block grant program?

Answer: The Administration is requesting in the FY 1983 budget the provision of Federal funds to the States for weatherization through the Low-Income Home Energy Assistance Program (LIHEAP) administered by the Department of Health and Human Services (HHS). This allows State and local governments to be responsible for decisions concerning public assistance for weatherization and fuel assistance for low-income. If there are no statutory changes, HHS will continue to allow up to 15 percent of LIHEAP funds (almost $200 million) to be allocated by States for weatherization activities in FY 1983. In addition, weatherization will be an eligible activity under the Community Development Block Grant Program administered by the Department of Housing and Urban Development.

Question: How can we be assured that such a program will continue under the block grant approach?

Answer: The weatherization program will continue under the Low-Income Home Energy Assistance Program (LIHEAP) administered by the Department of Health and Human Services (HHS). Early indications are that, in FY 1982, most States are allocating HHS funds for weatherization activities.

### Home Energy Efficiency Improvement

Question: It is interesting to see in other parts of the DOE budget that there is money for home energy efficiency improvement. The Bonneville Power Administration request includes $214,590,000 for home energy efficiency improvement. Of this amount, $116,850,000 is for residential weatherization. $13,700,000 for water heater wraps, $7,780,000 for flow control and $26,260,000 for solar/heat pump water heater. Although we agree that these programs are worthwhile, why would you limit application of these programs to Bonneville Power constituents?

Answer: These numbers are correct for the home energy efficiency activities. These activities are included in the, Bonneville energy conservation program for FY 1983. This electric rate payer financed program is authorized by the Pacific Northwest Electric Power Planning and Conservation Act -- P.L. 96-501 of December 5, 1980 -- which requires Bonneville to meet regional electric loads and treat cost-effective electric energy conservation as the region's highest priority resource in meeting those loads.

Such activities are in fact appropriate for other utilities throughout the rest of the country and a number of them are initiating similar programs.

## Regulatory Programs

Question: The Congress for FY 1982 continued funding for the appliance standards program, the residential conservation service, and the building energy performance standards. Please bring the committee up to date on how you are implementing these programs.

### Status of Appliance Standards

Answer: With regard to the appliance standards program, DOE is actively working in two specific areas.

First, the Department is continuing to develop and improve the test procedures for appliances. Test procedures provide a means to uniformly measure energy use for each of 13 products. These test procedures and the energy information derived from the tests allow manufacturers to accurately represent energy-efficiency and energy-consumption information in advertising and point-of-sale literature. The test procedures form the basis for information used in appliance labels under the Federal Trade Commission's Appliance Labeling Program. This information allows consumers to make an informed choice in purchasing appliances. DOE's efforts include responding to petitions for test procedure waiver from manufacturers that have developed a product which cannot be tested in accordance with the relevant DOE test procedure, or for which use of the test procedure results in a measure of efficiency or energy use not representative of its true value. This fiscal year, DOE has received two such petitions from manufacturers. Also, the Department has initiated rulemaking proceedings or is about to propose amendments to test procedures for six product types in order to incorporate test procedures for new products (e.g., heat-pump water heaters), to include test procedures for products for which a waiver had been granted (e.g., furnaces), or to take advantage of opportunities to reduce the testing burden (e.g., refrigerators and refrigerator-freezers). DOE and the National Bureau of Standards are continuing to evaluate the test procedures to determine if there are further opportunities for improvement.

Second, the Department is continuing its efforts regarding minimum energy efficiency standards for 13 types of appliances. The Department has completed an analysis of standards for 8 types of appliances and is preparing a notice of proposed rulemaking for these products. Once the proposed rule is published in the Federal Register, DOE will begin the analysis for 4 products. We expect the final rule for the 8 products and proposed rule for the 4 products will be issued this year. Rulemaking for one product has been postponed pending further test procedure development work.

## Status of Building Energy Performance Standards

Work on the Building Energy Performance Standards (BEPS) is also in progress in three areas: residential, mobile homes, and commercial.

A contract is in process to develop residential guidelines for homebuilders. This worrk will build upon current research work at Lawrence Berkeley Laboratory (LBL). The LBL residential research is under contract and fully funded. It consists of energy analysis of five prototypical residences in up to 48 locations. Many different conservation and passive strategies are being researched with each of the prototypes in each climate. The builder guidelines will translate this research into regionally specific information of a format useful to homebuilders. The contract to develop the guidelines is expected to be awarded within three weeks. A detailed plan and schedule is expected within four weeks of the contract award. The work plan will show detailed review by five to eight homebuilders and HUD technical personnel during the development of the guidelines. Substantive work is expected to be completed by the end of the calendar year.

A contract is also in process to develop mobile home guidelines for use by mobile home dealers and manufacturers. The contract will complete energy analysis work being carried out in FY 81. It will consist of analysis of single-width andd double-width mobile homes in ten climates. The prototypes represent 99% of current mobile home construction. The guidelines will translate this research into regionally specific inforation for dealers manufacturers. The objective is to develop energy savings and fuel cost information for a large variety of conservation strategies including insulation, glazing placement and sensistivity, orientation, infiltration and equipment efficiency. The work will be reviewed in detail duing its development by five to eight dealers, manufacturers, and HUD technical staff. Contract award is expected within three weeks. A plan is expected within four weeks of the contract award. Substantial work is expected to be completed by the end of the calendar year.

Commercial building work is underway at Battelle Northwest Laboratory (BNL). An action to complete funding is expected to be in place within four weeks. The work builds on the existing BEPS research. Sensitivity analyses of over 200 commercial building designs will be performed using the completed energy estimating tool DOE-2 and other estimating techniques. This research will be used by Battelle to suggest cost effective changes to the component performance standard ASHRAE 90-75. This standard has been adopted in 47 U.S. states. The suggested changes will be accompanied by an appendix containing whole building energy budgets for over 200 commercial buildings. The work will be reviewed while in progress by ASHRAE (The American Society of Heating, Refrigerating and Air-Conditioning Engineers), AIA (The American Institute of Architects) and other pertinent building industry groups. A detailed plan of this work is expected in four weeks. Research should be substantially complete by January of next year.

## Status of Residential Conservation Service

In relation to the Residential Conservation Service, annd other regulatory responsibilities, we plan to carry out the following activities in FY 1982:

- Issue final revised regulations for the RCS program during late May.
- Repropose regulations to implement the Commercial and Apartment Conservation Service (CACS) and the RCS Federal Standby Plan by early summer.
- Continue the review and approval of State and utility implementing plans, includding amendments to those plans and Temporary program requests.
- Initiate a significant effort to evaluate the actual costs and effects of the program.
- Continue to monitor the implementation of the program, including potentially anti-competitive activities, and submit the required annual report on such efforts.
- Continue to support limited research and the dissemination of technical information to assist utilities and States in implementing the program.

## Future Program Activity

Question: Since these are mandatory programs for which you have requested no funds in FY 1983, how do you propose to carry out these programs?

Answer: Although the administration believes that these regulatory programs should be terminated, we have been active in implementing them during this fiscal year, as our answer to the previous question indicates. We will continue to work on them to the extent that they are funded by Congress.

## Analysis to Support Termination

Question: What analysis do you have that would support terminating these programs?

Answer: With regard to the appliance standards program, DOE's analysis regarding the need for appliance minimum energy efficiency standards is presently being documented and will be available with the notice of proposed rulemaking regarding energy efficiency standards for eight products. The proposed rule is expected to be published in the Federal Register within 30 days.

In relation to analysis supporting termination of the residential conservation service and related regulatory programs, there is considerable evidence that energy is being conserved in residential and commercial buildings now. The growth of energy demand in this sector has slowed or stopped and there are signs that energy efficiency improvements are being realized. Energy tax credit claims indicate a very substantial level of investment in a wide range of conservation and solar energy products.

In addition, energy conservation services now being provided voluntarily by utilities, private firms and some State and local governments appear to be sufficient to ensure that consumers have adequate information and assistance to make rational decisions on energy conservaion investments.

The specific impact of the RCS and CACS programs cannot be determined easily, but it is almost certainly considerably smaller than the total effect of energy prices and other factors now in place. A revised Regulatory Impact Analysis for the RCS is now being prepared which will attempt to shed more light on this issue.

Regarding building energy performance standards, it is too early in the development of the guidelines and modifications to ASHRAE 90-75 to have analysis regarding termination. As work progresses, as DOE receives comment from the reviewers, and as a public meeting is held to receive technical comments, such analysis will be performed.

## Big Hill Deferral

Question: In conjunction with the FY 1983 budget submission you have proposed deferral of $52,860,000 to delay Phase 3 development at Big Hill, Texas. Presumably, this is merely a device to delay outlays to relieve budgetary pressures. What is the effect of this deferral on the Strategic Petroleum Reserve program?

Answer: This deferral represents a one-year delay in land and equipment purchases for Big Hill. The site development schedule will be delayed for one year but site design will continue. This delay will affect the SPR fill schedule after 1986 and will result in completion of the 750 million barrel program in 1990, rather than in 1989 as previously planned.

Question: What assurances do we have that there will be no further delay if we do agree to this deferral?

Answer: The slippage in the Big Hill development schedule represents a near-term Federal budget decision. At this time, we have no indication that there will be a further slip in the schedule.

Question: If we decide not to agree to this deferral, what would be necessary in FY 1983 to keep the Big Hill development on schedule?

Answer: The Big Hill project can be placed back on schedule (in terms of 1987-1989 fill capability) by:

- Restoration of $53 million of FY 1982 funds no later than May 1, 1982, and
- Exercising the authority for land condemnation without negotiation. (Big Hill can be acquired within 90 days from Secretarial Authorization), and either
    - Appropriation of $380 million over the President's 1983 Budget to commence simultaneous drilling and construction activities in FY 1983, or
    - Appropriation of $150 - $200 million over the President's 1983 Budget coupled with legislative authority to permit incremental funding of the fixed price drilling and construction contract to be awarded in FY 1983.

Question: There are indications that the price of oil is declining. Under these circumstances, should we not be moving more quickly to develop alternative or temporary storage?

Answer: Market conditions are favorable at the present time for acquiring oil for the Reserve. However, we have arranged for delivery of nearly all the oil we plan to have delivered to permanent SPR oil facilities in FY 1982. The President's FY 1983 budget proposals do not contemplate the storage of SPR oil outside the level permitted by permanent storage capacity. However, as part of the continuing process of program management planning, during early 1982, the Department has undertaken to evaluate possibilities for acquiring oil for the SPR in excess of the rate permitted by permanent storage capacity by securing the use of existing private sector storage on an interim basis.

The analyses have not yet yielded firm conclusions. Some industry sources have indicated that interim storage opportunities exist both in terms of floating storage on surplus tankers and in terms of onshore storage both underground and aboveground. As these options are further defined, the Department will evaluate such options in terms of overall reasonability and practicality. We would need to assure that we had both the budget resources and oil market conditions to maintain development and fill of permanent facilities before we took actions to secure interim storage capacity.

## EMERGENCY PREPAREDNESS

Question: The summary report of the Sunset Review (p. 40) states that development of adequate levels of petroleum stocks that can be drawndown in an emergency is one of the most direct and cost-effective solutions to a major disruption in oil supplies. What measures have you taken to encourage private stockpiles as a buffer to a major oil supply disruption?

Answer: The Administration believes the main disincentive to building private stockpiles is the threat of reimposing price and allocation controls. The Department has made it clear that it does not intend to reallocate private stocks which have been stored by private companies per their own use. In addition, the knowledge that SPR volumes are available to the nation in an emergency also reassures the private sector that private stocks will be left to be used as the free market determines. Also, the Department is examining additional ways to encourage industry to hold large inventories for use during a disruption.

Question: How successful have these efforts been?

Answer: We have no present basis for evaluating the effectiveness of the Administration's opposition to price and allocation controls on oil in encouraging an inventory buildup. Since we are still evaluating other prospective measures, it would be premature to speculate on their likely effectiveness.

Question: What quantity of oil would be available for draw down in an oil supply emergency? To whom would these supplies be distributed?

Answer: On February 26, 1982, private stocks of crude oil and refined products stood at 1,191 million barrels. We estimate that between 200-400 million barrels of that amount may be made available for use during an oil supply disruption. If used, such stocks would be distributed by industry according to market forces.

## EMERGENCY PREPAREDNESS

Question: The emphasis of the current program is to rely primarily on the market, with the government acting only to facilitate market operations in response to severe supply disruptions where vital public services may be disrupted because of limitations in responding to sharply higher prices. What authority do you currently have to step in during an emergency?

Answer: Sections 202 and 251 of the Energy Policy and Conservation Act of 1975 (P.L. 94-163) authorize the United States to meet its obligations under the International Energy Agency and to restrict the public and private use of energy. The Emergency Energy Conservation Act of 1979 (P.L. 96-102) authorizes restrictions on the end-use of energy. The Defense Production Act of 1950 (P.L. 81-774, 50 U.S.C. App. 2061, et seq.) provides authority to allocate oil supplies for national defense purposes should it become necessary during a major disruption. Executive Order 11490, as amended, assigns emergency preparedness functions to Federal agencies dealing with petroleum, natural gas, solid fuels, and electric power. Section 404 of the Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) and the waiver authority under section 110(f) of the Clean Air Act Amendments of 1977 (P.L. 95-95, 42 U.S.C. 7410) encourage fuel switching and increased efficiency in fuel use.

Section 202 of the Federal Power Act (16 U.S.C. 792 et seq.), provides an additional legislative mandate to deal with electricity-related emergencies, such as issuing orders for emergency interconnections and developing electricity emergency plans. Section 232(b) of the Trade Expansion Act of 1962 (P.L. 87-794) provides authority to impose fees and quotas on oil imports based upon findings that oil imports threaten national security. Sections 301 to 304 of the Natural Gas Policy Act of 1978 (P.L. 95-621) provide emergency authority related to natural gas supplies during a severe shortage. Section 607 of the Public Utility Regulatory Policies Act of 1978 (P.L. 95-617) provides authority to prohibit the burning of natural gas by any electric powerplant or major fuel-burning installation. Authority also exists under the International Emergency Economic Power Act of 1978 (P.L. 95-223) to declare a national emergency to deal with any unusual and extraordinary threat to the national security, foreign policy, or economy of the United States.

Section 161 of the Energy Policy and Conservation Act of 1975 (P.L. 94-163) provides for draw down and distribution of the SPR oil during a severe supply interruption, and a plan for such distribution was approved by Congress in 1979.

During a severe interruption, if there is a need to have NPR surge production the President can ask the Congress for such authority.

Question: What would the government role be to assist vital public services that may not be able to respond to sharply higher prices?

Answer: It is the Administration's policy to place primary emphasis on measures designed to facilitate the operation of market forces during energy supply disruptions. The Administration is firmly opposed to the re-imposition of regulatory controls and is assessing plans for removing regulatory and other barriers to efficient emergency energy use. We are also continuing our analysis of potential measures to mitigate adverse economic and social impacts of severe supply disruptions and have initiated efforts designed to provide necessary information during a supply disruption. An important aspect of these efforts is to encourage suppliers and consumers, as well as State and local Governments, to develop their own contingency plans.

## EMERGENCY PREPAREDNESS

Question: One of the emergency preparedness program goals for FY 1982 (p. 76) is to establish facilities to coordinate communication and operations during energy emergencies, including direct intercoordination with state and local energy offices. Yet, in the Energy Information Administration (p. 120) you are eliminating state access to automated public use data and in conservation you are eliminating support for state energy offices. If you do not support the state energy offices, how can you be sure there will be a state energy office with whom to coordinate?

Answer: Each governor designates the appropriate state offices to be the Department's contact for energy emergencies. In most cases they are the state energy offices. However, depending on the nature of the emergency and the expertise needed, other offices may be our points of contact. In some cases a governor may designate his own staff or that of another agency within his branch (such as the department responsible for emergency services) as the coordinating agency. In fact, many state energy offices work closely with emergency services departments. The Environmental Protection, Safety, and Emergency Preparedness staff encourages the strengthening of links between those offices and as a step in that direction, we have linked almost all such offices through our DIALCOM electronic message system.

Question: Could you explain why you would eliminate state access in one program and attempt to facilitate it in another?

Answer: The Energy Information Administration has eliminated state access to automated public use data because of the limited on-line use of these data by States in the past. States will continue to receive regular publications containing the data. Also, the Energy Information Administration has offered the States public use data tapes, which are updated monthly. That change will give States data in their most economical and useful forms. In a recent workshop with the Energy Information Administration on data needs, State representatives maintained that regular Energy Information Administration publications meet their needs.

### EIA Mid- and Long-Term Projections

Question: The 1983 request for the Energy Information Administration is $54.5 million, a reduction of $25 million from the 1982 appropriation. The justification highlights elimination of all mid- and long-term projections as well as elimination of numerous legislatively required reports to achieve this reduction. If EIA mid- and long-term projections are eliminated, what objective sources of information will be available?

Answer: There are a number of objective sources of mid- and long-term projections of energy production and consumption. In addition to forecasts prepared by major oil companies, the following organizations have produced mid- and long-term projections: the Congressional Budget Office, the Office of Technology Assessment, the Central Intelligence Agency, the Electric Power Research Institute, the International Energy Agency, the Irving Trust Company, the World Bank, the Workshop on Alternative Energy Strategies, the Massachusetts Institute of Technology, Pace Company Consultants and Engineers, and SRI International. While not all of these sources produce mid- and long-term projections on an annual basis, there appear to be sufficient sources available to meet the needs of those who use these projections.

### Rationale for Eliminating Mid- and Long-Term Projections

Question: Other than for budget savings, why should EIA retreat from making mid- and long-term projections?

Answer: There are inherent uncertainties in making forecasts of any kind. There are a multitude of assumptions about the economy and about energy production and consumption that are fed into any given model. If any one of these assumptions does not come to pass within the forecasted range, and many do not, the model will produce projections that will fluctuate widely. This is not the fault of the model in most cases. But the variances render the product marginally useful in comparison with other EIA information products. Because of the inability to predict accurately all the underlying assumptions for the mid- and long-term, EIA has chosen to concentrate its efforts on the short-term, which it is extending to five years. EIA will continue to maintain its data bases so that other organizations which rely on EIA data for making mid- and long-term projections can continue to do so.

## "EIA Amendments Act"

Question: Although legislation to trim EIA reporting requirements was introduced in May 1981, no action has been taken and none appears likely. What provisions have you made to carry out these reports, if the requirement still exists in FY 1983 and you have not asked for additional funds?

Answer: If S. 1281, the "EIA Amendment Act" does not pass, EIA will continue to meet the information requirements contained in the various laws within the context of the resources available. If additional resources are not forthcoming, some reports may be reduced in scope and frequency. For example, EIA will continue to conduct mid- and long-term forecasting activities if legislation to exempt it from this requirement does not pass. However, these forecasts may use fewer and simpler models, resulting in fewer projections. Similar accommodations will be made with regard to the requirements of the Emergency Energy Conservation Act and other legislation from which EIA has sought relief.

EIA fully intends to carry out the provisions of all legislation governing its activities to the extent possible within the context of the resources that are available.

## Fuels Conversion Program

Question: Fuels conversion is another program the Congress had to keep alive in FY 1982 and once again for FY 1983 you propose to terminate it. In view of the fact that under the current program only those utilities desiring coal conversion orders are actually issued orders, why is it necessary to terminate this program?

Answer: The budget request reflects the Administration's view that the appropriate way to facilitate coal conversions is by directly addressing the impediments contained in the Clean Air Act so that utilities may voluntarily convert powerplants with the same benefits presently accorded only those facilities converting with DOE orders. The Congress is currently reviewing the Clean Air Act and considering amendments which would accomplish this objective. We are following these proceedings closely. If essential functions remain to be accomplished in fiscal year 1983, DOE will propose a budget adjustment.

Question: Doesn't this program facilitate conversion of oil-fired generating plants to coal rather than acting as a regulatory impediment?

Answer: Certainly at present this is the case. The DOE prohibition orders accord converting facilities preferential treatment under the Clean Air Act.

## Leasing Activities

Question: In the Interior and Related Agencies FY 1982 Appropriation Act P.L. 97-100 returned certain functions related to the leasing of Federal lands to the Department of Interior. Have you in fact terminated DOE leasing activities?

Answer: No, we are continuing to perform leasing activities until a transfer of function is effectuated between DOE and DOI.

Question: What has happened to the people associated with this function? Have you transferred them to DOI?

Answer: We believe that the Appropriations Act language calls for a transfer of functions between the two Federal Departments, and as such employees, associated with leasing activities, are entitled to transfer with the function to DOI. It is our intention to effectuate the transfer of program activities, budgeted funds and associated staffing resources as soon as possible. We will continue to meet with DOI officials until an accord is reached in these areas.

## Energy Impact Assistance

Question: The Administration has proposed a recission of $20 million - $14 million of energy impact assistance and $6 million in state energy conservation grants that had been identified to assist the states in preparing for gasoline rationing. Why do you propose to rescind the energy impact assistance money? Is there no demand for the program?

Answer: In the past, DOE has carried out this program in cooperation with the Farmers Home Administration, which is the grantor agency. We believe that state and local governments are in a better position to assess impact assistance needs and to ensure that energy production firms pay their fair share of such costs.

Question: Could the States not use the gasoline rationing money to improve their emergency preparedness activity?

Answer: Plans to award the State grant money were suspended conincident with the cancellation of the gasoline rationing program approximately one year ago. The efficacy of this decision is supported by the continuing abundance of crude oil and product. Without a costly and time consuming grant application and monitoring process there is no way of knowing whether the distribution of funds to the States would be sufficient to make any real difference. Therefore, given the severe pressures on the budget it was deemed appropriate not to spend the money.

QUESTIONS SUBMITTED BY CONGRESSMAN CLARENCE D. LONG

Question: I am concerned about the lack of balance in your overall energy budget request. How do you justify continued high and disproportionate subsidies for nuclear programs at the expense of conservation, particularly at a time when the market is backing away from nuclear power for economic reasons?

Answer: The Department of Energy supports the production and conservation of energy from all sources. Indeed, if we are to achieve our goal of energy security, we should be using all of the technologies and fuel available to us without exception.

However, we are focusing Government energy research toward long-term, high-risk, potentially high-payoff projects. The appropriate place for the demonstration and commercialization of near-term energy options such as conservation is the private sector. There is ample evidence that market forces are stimulating conservation more effectively than Federal subsidies ever could.

Funds for the nuclear program are heavily weighted toward Congressionally mandated waste programs and toward advanced reactor programs such as breeders. The breeder is a long-term option that is expected to provide energy needs in the next century when many resources, including uranium, may be getting scarce. The breeder removes this resource constraint. The time necessary to develop this technology is longer than is appropriate for a private sector project so the pre-commercial development must be done by Government if it is to be ready on a timely basis.

## Energy Research Advisory Board Advice

Question: The Energy Department's own Energy Research Advisory Board has concluded that disproportionate amounts of Federal money are being poured into technologies--most of them nuclear--to generate electricity and into attempts to expand energy supply, and not enough into conservation. Why did you choose to ignore this Panel's advice in developing your fiscal '83 budget request?

Answer: The Energy Research Advisory Board based its conclusions on the FY 1982 budget requested by the President. In fact, the Congressional appropriation for conservation and improved end-use utilization was almost $100 million above the President's request. This action reduced the few substantial differences between the Board's conclusions and the budget originally requested. One of the limitations of the advisory process is that the Department was not able to provide the Board with information on the FY 1983 budget, which was being prepared in September 1981, when the Board was arriving at its conclusions. Therefore, they were unaware of the severity of the budgetary problems facing the Nation, and of the sharp reductions in the budget that would be necessary due to the magnitude of the projected budget deficit. Finally, their report was not formally transmitted to the Department until early December 1981, when most of the decisions on the FY 1983 budget had already been made.

## State Energy Offices

Question: Do you have any estimates as to how many State Energy Offices will close or restrict their funding as a result of your decision to eliminate funding for state and local conservation programs?

Answer: In early March, DOE surveyed the State Energy Offices (SEO's) to determine whether or not they would continue operations under the proposed FY 1983 closeout budget. Eighteen States, the District of Columbia, and six territories have indicated that their SEO's would not continue without Federal funds. The following table provides the current Federal/State funding percentages for each SEO, and the impacts of the proposed FY 1983 budget.

Table

| State | Share of State Energy Budget (%) Federal | Share of State Energy Budget (%) State | Likely to survive without Federal money? |
|---|---|---|---|
| Alabama | 88 | 12 | Yes |
| Alaska | 26 | 74 | Yes |
| Arizona | 77 | 23 | No |
| Arkansas | 70 | 30 | Questionable |
| California | 35 | 65 | Yes |
| Colorado. | 100 | 0 | No |
| Connecticut | 50 | 50 | Yes |
| Delaware. | 100 | 0 | No |
| District of Co. | 99 | 1 | No |
| Florida | 80 | 20 | Questionable |
| Georgia | 95 | 5 | Questionable |
| Hawaii | 85 | 15 | Yes |
| Idaho | 100 | 0 | Yes |
| Illinois | 86 | 14 | Questionable |
| Indiana | 77 | 23 | No |
| Iowa | 99 | 1 | No |
| Kansas | 80 | 20 | Yes |
| Kentucky | 10 | 90 | Yes |
| Louisiana | 75 | 25 | Yes |
| Maine | 80 | 20 | Yes |
| Maryland | 77 | 23 | Yes |
| Massachusetts | 68 | 32 | Yes |
| Michigan | 35 | 65 | Yes |
| Minnesota | 46 | 54 | Yes |
| Mississippi | 55 | 45 | Yes |
| Missouri | 99 | 1 | No |
| Montana | 66 | 34 | Yes |
| Nebraska | 76 | 24 | Yes |
| Nevada | 90 | 10 | No |
| New Hampshire | 55 | 45 | Yes |
| New Jersey | 65 | 35 | Yes |
| New Mexico | 58 | 42 | Yes |
| New York | 40 | 60 | No |
| North Carolina | 90 | 10 | Yes |
| North Dakota | 95 | 5 | No |
| Ohio | 60 | 40 | No |
| Oklahoma | 100 | 0 | No |
| Oregon | 30 | 70 | Yes |
| Pennsylvania | 60 | 40 | Yes |
| Rhode Island | 94 | 6 | No |
| South Carolina | 90 | 10 | No |
| South Dakota | 90 | 10 | No |
| Tennessee | 60 | 40 | Yes |
| Texas | 35 | 65 | Yes |
| Utah | 85 | 15 | No |
| Vermont | 25 | 75 | Yes |
| Virginia | 80 | 20 | No |
| Washington | 60 | 20* | Yes |
| West Virginia | 90 | 10 | Questionable |
| Wisconsin | 75 | 25 | No |
| Wyoming | 99 | 1 | Yes |

*20% comes from Bonneville Power Administration

Source of data: Telephone survey of State Energy Offices, March 8 and March 9, 1982.

## Impetus for Reduced Oil Consumption

**Question:** Has the Department of Energy conducted any studies which indicate how much of the nation's reduced oil consumption is due to conservation and how much has been forced by recession?

**Answer:** The Department funded a study by Oak Ridge National Laboratory (Energy Use From 1973 to 1980: The Role of Improved Energy Efficiency, ORNL/CON-79, December 1981) which estimated that the 20 Quads in reduced energy use in 1900 (as compared with an historical trends projection) was due to the following major factors:

| | |
|---|---|
| Lower GNP (recession is in here) | 50% of reduction |
| Increased Fuel Prices | 40% of reduction |
| Other factors (including Federal conservation activities) | 10% of reduction |

It has been estimated that Federal conservation efforts have been responsible for about 5% of the energy reduction (or about half of the "other" factor contribution estimated by ORNL).

## Impetus for Energy Conservation

Question: Do you have any statistics which show how much of the Nation's conservation effort has been due to price increases as a result of decontrol and how much has been due to Federal conservation programs?

Answer: The analysis performed by Oak Ridge National laboratory (which is described in the earlier answer) is the best response to this question also. About 40 percent of the energy use reduction appears to be due to fuel price increases only part of which has been due to price decontrol of natural gas. The generally-accepted estimate for the Federal conservation effect is 5%.

## Decontrol of Natural Gas

Question: I am deeply concerned about this Administration's support for accelerated decontrol of natural gas. What evidence do you have of the amount of recoverable gas reserves and the additional gas output that would be developed if natural gas is decontrolled?

Answer: As of December 31, 1980, U.S. proved reserves were estimated by EIA to be 30 billion barrels of oil and 199 tcf (34 billion barrel equivalent) of natural gas. Regarding undiscovered recoverable reserves, the U.S. Geological Survey's best estimate (given in USGS Circular 725) is currently 594 tcf (102 billion barrel equivalent) of natural gas. This comperes with 83 billion barrels of recoverable oil reserves. The USGS estimate excludes tight sands, which the National Petroleum Council estimates to have a recoverable resource base of over 350 tcf. The Potential Gas Committee, an independent research group, claims that the USGS did not pick up at least 100 tcf of recoverable gas reserves below the 15,000 foot level.

The next issue is how different natural gas policies will affect the exploitation of this resource base. First, the Administation is not arguing a case of natural gas decontrol versus continued price controls. Natural gas will be partially decontrolled under the Natural Gas Policy Act (NGPA) in 1985. The Cabinet Council proposal for accelerated price adjustments leading to full decontrol of all gas categories in 1985 is not based on the argument that this would greatly increase gas output. Rather the argument is that this alternative to NGPA will lead to a smoother transition to decontrol, will avoid market disorders under NGPA, lead to better fuel choice/conservation decisions, and promote a more rational/cost-effective development of gas supplies. Current policy allows high prices for gas from the most expensive sources of supply and provides low prices for gas from sources that are relatively inexpensive. This is not an efficient, cost-effective way of developing our resource base. This argument is described in detail in the DOE study "A Study of Alternatives to the Natural Gas Policy Act of 1978".

The Cabinet Council proposal is projected to result in a 1.2 tcf increase over NGPA production through 1985. After 1985, however, there is more production under the NGPA. By 1990 there is .5 tcf more yearly production under NGPA than the Cabinet Council proposal.

One reason for this is that the conventional resource base is exploited faster and more efficiently (resulting in more production early on), under the Cabinet Council scheme, but the more expensive unconventional supplies are not subsidized as fully as they would be under NGPA in the late 1980's. In addition there is less production because the market dictates less production. Higher consumer prices lead to less demand which in turn draws forth less supplies.

## Fossil Energy Projects

Question 5: What near-term work will not be completed in fossil fuel projects as a result of the budget cuts? Do you have any indication that industry will fund these projects to completion? Are any of these projects ready for large-scale applications?

Answer: For the purpose of this response, project completion is viewed as the point at which a project is concluded because sufficient R&D has been performed to allow the private sector to pursue further development. Near term projects that are being concluded at this milestone are: Bi-Gas pilot plant, HYGAS, EDS pilot plant, H-Coal pilot plant, Liquid Phase Methanol process development unit, High Temperature Turbine Test, Magnetohydrodynamics, Westinghouse agglomerating fluidized-bed gasifier, Combustion Engineering atmospheric entrained-bed slagging fixed-bed gasifiers at METC and GFETC, Unconventional Gas Recovery third multiwell test, Enhanced Oil Recovery field experimentation in Utah tar sands and Geokinetics horizontal modified in situ project in Utah.

There are indications that industry will continue near-term work on several of the projects. As an example, the private sector participants of the EDS project will totally fund the third coal tests and negotiations are in progress with Ashland Synthetic Fuels, Inc., regarding the transfer of the government title and continued operation of the H-Coal facility. A transfer of the government title of the agglomerating fluidized-bed gasifier to Westinghouse is also being considered under appropriate terms and conditions and discussions have been held that suggest that Phase III efforts of the High Temperature Turbine Test project will be conducted without government funding although a different technical approach will be utilized. Further, given the decontrol of oil prices and the various tax and financial incentives that are available to the oil industry, it is reasonable to postulate that the private sector will continue R&D in the areas of tar sands and shale oil.

Several projects are also ready for large scale applications. Exxon's EDS program manager, Mr. W. R. Epperly, was quoted by Energy Research Digest as saying "that the liquefaction section of a 20-30,000 ton per day commercial-size (EDS) plant operating on Illinois No. 6 coal could be designed when commercially justified". Another example is that H-Coal is considered one of the front runners of the 11 projects selected for detailed study by the SFC on January 11, 1982. In addition, Hydrocarbon Research and C. Itoh & Company of Japan have signed an agreement on the first phase of a multi-phase program that could lead to the construction of a commercial H-Coal plant in the People's Republic of China. Also, Westinghouse has interested the South African SASOL industry in the use of their technology to process coal fines that the SASOL Lurgi process cannot handle. Finally, there are a number of commercial operations extracting oil tar sands and shale that are currently in existence.

## Appropriate Technology Grants

Question: What plans does the Department of Energy have to assure the technical quality of the Appropriate Technology Grants that were awarded in previous years? Can the Department assure Congress that these grants will be monitored so that problems are promptly identified and resolved?

Answer: The Department of Energy has routinely included grant monitoring as an integral part of the Appropriate Tech-nology programs since its beginning. All ten Federal regional offices have established grant monitoring procedures that provide ongoing information on a "need-toknow" basis to the Department about the technical quality of the grants. Built into these procedures is also the availability of technical assistance to the grantees wherever the need is manifested. This practice will continue.

## Utilization of NCAT

Question: I am concerned that Congressional intent is not being followed by the Department in utilizing the National Center for Appropriate Technology to both monitor Appropriate Technology Grants previously awarded and disseminate the results of successful projects. Why has the Department decided not to use NCAT to perform both these tasks?

Answer: The Department has recently issued a funding request to enter into contract negotiations with the National Center for Appropriate Technology (NCAT). The contractual arrangement would have NCAT perform, among other duties, onsite technical assistance to projects as needed, review of all completed grant projects and all information acquisition and dissemination activities for the Appropriate Technology program. NCAT will therefore perform both monitoring and dissemination tasks as requested by Congress. Our operations offices already have in place qualified contractor support for performance of such grant monitoring functions as recordkeeping and interim report review. It is felt that eliminating this experienced support and utilizing a new contractor to perform these functions with the short time period remaining on these grants would be an inefficient use of funds.

## QUESTIONS SUBMITTED BY CONGRESSMAN NORMAN D. DICKS

### Energy Conservation Funding

Question: I understand that the FY 1983 request for Energy Conservation Programs (both R&D and Low-Income Weatherization Grants) is only $21 million. How can you justify this funding level when energy conservation is the most cost-effective energy saving measure? ($400 million was appropriated for these programs in FY 1982)

Answer: There is very little linkage between Federal Government expenditures for conservation and conservation accomplished. Also, much more conservation can be accomplished without any further research. However, it is our intent, based on program and budget priorities, to continue R&D in those areas which the private sector cannot reasonably be expected to pursue, and which appear to have merit.

### Reorganization of Federal Energy Functions

Question: Mr. Secretary, the budget proposal submitted by the Administration would abolish the Department of Energy and distribute its programs to the Departments of Interior, Commerce and Justice. The President has also proposed to RIF at least 4,000 Department employees. If Congress were to approve this proposal could these Departments fulfill DOE's statutory responsibilities?

Answer: The President has not proposed to RIF at least 4,000 Department employees. The FY 1983 budget proposals contain programmatic reductions and redirects certain policy initiatives which, if supported by the Congress, will require reductions-in-force in early FY 1983. However, we are unable to state the specific size of any RIFs until the FY 1983 budget is acted on by the Congress and approved by the President.

If Congress approves the President's proposal to reorganize Federal energy functions as submitted in the FY 1983 budget the other Departments will be able to fulfill DOE's statutory responsibilities.

## Renewable Energy Budget Reductions

Question: You propose to reduce funding for energy supply R&D programs about 21% -- $403 million -- largely in solar and renewable energy activities? What is your justification for this?

Answer: Following the oil embargo of 1973, and until 1980, the United States faced a problem which was quite different from those we had faced in the past. It appeared that our sources of energy were being exhausted. We were becoming more and more dependent upon oil imported from the Middle East. While prices charged for this oil were escalating rapidly, most of the prices for domestically-produced oil and natural gas were controlled at very low levels. Inexpensive energy, one of the basic building blocks of our economy, was becoming a thing of the past. During this era, federal expenditures for research, development, demonstration and commercialization of alternate energy systems grew exponentially.

For a number of renewable or alternate energy technologies, the Federal role in R&D has been essentially completed, and industrial capacity as well as consumer demand has built to the point where the private sector can assume primary responsibility for continued development or commercialization. Specifically, active heating and cooling, passive and hybrid systems, and hydropower can be, and are being supported by private investments. While further technical advances may be possible, such developments can be left to private industry to pursue in response to free market forces. Similarly, the private sector is expected, over time, to be able to take over Electric Energy Systems projects and Energy Storage technology development.

Major changes in the energy marketplace are also providing improved opportunities for renewable energy. The price decontrol of petroleum and scheduled price decontrol of natural gas has effectively removed subsidies from competing fuels, removal of unnecessary regulatory burdens has streamlined siting requirements, and R&D tax credits will stimulate private sector technology development.

For other technologies, the continuation of Federal Government participation in research is needed to provide the technical basis for industry to develop these concepts to a point where potential suppliers and users may begin making their own capital investment. With many of the demonstration projects completed and proof-of-concept clearly established for several technologies, the Department proposes to emphasize continuing long term research while phasing out technology development efforts that can be pursued by the private sector at rates consistent with their economic potential. The FY 1983 renewable energy budget request will be used to support these research programs at a level consistent with requirements of orderly specific development.

## QUESTIONS SUBMITTED BY CONGRESSMAN LES AuCOIN

Question: I note your proposed budget calls for approximately an 87% reduction in funding for energy conservation programs. What percent of the total FY 83 DOE budget does funding for conservation represent?

Answer: The FY 1983 budget request for Conservation and Renewable Energy programs (excluding the Power Marketing Administrations) is about 0.9% of the total Department of Energy budget request for FY 1983. Of this 0.9%, about 0.2% is for Conservation programs and about 0.7% is for Renewable Energy programs.

## Nuclear Research and Commercialization

Question: What percent of the total FY 83 DOE budget does funding for nuclear research and commercialization represent?

Answer: Let me start answering this question by pointing out that the programs managed by the Assistant Secretary for Nuclear Energy include basic responsibilities of the Department. These are: supporting national defense needs through civilian control of research, development, production and testing of nuclear weapons; performing tasks such as operation of Federal resource reserves, power marketing, and utility regulation as required by law; and providing support to long-term, high-risk, high-payoff research, but not research and development for the purpose of accelerating new technologies into the marketplace.

Of the $3.4 billion requested in the FY 1983 budget, approximately $.4 billion falls in the first category for the Naval Reactors program.

An additional $2.3 billion in FY 1983 is required to perform activities assigned by law to the Federal Government. The principal elements are: Uranium Enrichment - $2.0 billion, and Waste Management - $300 million.

This leaves approximately $670 million in the DOE Energy Supply R&D budget for nuclear R&D programs which have long-term, high-risk, high-payoff commercialization potential. This compares to the FY 82 request for these programs of $796 million, reflecting a 16% reduction.

As a percentage of the FY 83 budget of $11.8 billion, $670 million is about 5.6 percent.

## TECHNOLOGIES

Question: Your budget justification indicates that the private sector "has a very strong financial incentives to develop and demonstrate technologies that appear technically and economically promising." Yet, you oppose federal funding for "technologies that are not yet economically competitive." Do you really expect the private sector to develop technologies that are not yet economically competitive?

Answer: A technology that is "not yet economically competitive" is not necessarily unattractive to the private sector. In fact, many technologies developed by the private sector and now in use started out at a competitive disadvantage. It is only through research, development and manufacturing engineering that changes and improvements are made to allow lower manufacturing costs and greater in-service benefits. Given American industry's demonstrated ability to see beyond short term research problems to longer term market gains, we believe that the private sector will continue to undertake an appropriate level of longer term technology development.

### Funding for Nuclear Related R&D

Question: Since 1978, no United States utility has ordered a nuclear plant and the growth in demand for electrical energy has dropped. Even Wall Street's support for the technology is faltering. Given these factors, how do you justify expending 87 percent of the energy technologies budget on nuclear program?

Answer: You ask for justification for allocating 87 percent of the energy technology budget for nuclear programs given lower electricity demand growth and a lack of nuclear plant orders. The FY 1983 budget request actually shows a decrease in all energy technology research including nuclear fission programs. Nuclear fission related research comprises about 47 percent of these funds.

The long lead time to build large nuclear and coal plants coupled with the reduced rate of growth for electricity has resulted in a capacity oversupply while the construction pipeline adjusted to the lower growth rate. This explains the lack of nuclear plant orders and the cancellation of many plants previously ordered. Nuclear plants were hardest hit because of their high capital cost, the uncertain regulatory climate and the poor financial condition of the utility industry.

However, electricity demand growth is still substantial and is expected to continue consonant with strong economic growth. This demand growth can only be met by coal and nuclear plant additions. Both economics and the spectre of serious environmental limitations to unlimited coal use ($CO_2$ buildup, acid rain, etc.) indicate that resumption of nuclear growth is inevitable. Only a small portion of the technology budget applies to the current generation of reactors because they are already in commercial status. There are significant research efforts for nuclear waste disposal which must be carried on in any event.

The bulk of the nuclear fission technology research budget is allocated to breeders. This long-term technology is not dependent on nonrenewable resources which will eventually be depleted. This allocation supports our policy of limiting Government research to long-term, high risk, potentially high payoff programs.

## Clinch River Breeder Reactor

Question: Do you feel the Clinch River Breeder Reactor is economically competitive?

Answer: The Clinch River Breeder Reactor Plant will generate 350 megawatts of electricity which it will sell to the Tennessee Valley Authority for distribution over their grid. There will be net profits from the sale of this electricity in that the revenue from the sale of power will exceed the plant's annual fuel and operating cost. However, the CRBRP project was conceived as a major research and development project that would generate important information on the design, construction, and operation aspects of breeder reactors at an intermediate scale. Thus, the project was not conceived as a means of producing electrical energy at rates competitive with other commercial technologies such as coal and light water reactors.

## U.S. Oil Imports

Question: Can you provide the Committee with information showing what the U.S. oil import levels were five years ago compared with today?

Answer: In 1977 the U.S. imported a net average of 8.6 million barrels of oil a day, including imports for the Strategic Petroleum Reserve (SPRO), which began importing small amounts of oil in October of that year. In 1981, the U.S. imported a net average of 5.4 million barrels a day, including an average of 0.3 million barrels a day for SPRO. Imports needed for consumption dropped in 1981 by an average of 3.5 million barrels a day--from 8.6 to 5.1 million barrels a day. Preliminary data has shown that currently net imports have fallen to about 3.7 million barrels a day, the lowest level in over 10 years.

## Reasons for Reduction in Oil Imports

Question: If lower, what do you feel are the reasons for this reduction in imports?

Answer: The rising price of oil has led to a drop in demand for petroleum products in all sectors of the economy. Drivers have switched to cars with higher mileage, and they have been driving less. Homeowners have switched from home heating oil to other fuels. They have insulated their homes and have purchased energy-efficient appliances. Electric utilities have switched from oil to other means of generating electricity, principally coal. The industrial and commercial sectors of the economy have made great reductions in their consumption of oil through conservation measures and fuel switching. Additionally, the current lower-than-average level of economic activity has led to lower demand for oil in the industrial and commercial sectors. On the supply side, domestic production has remained flat, rather than declining, as it did in previous years, and there has been a significant draw down of petroleum stocks.

Question: What role do you feel conservation played in reducing the level of consumption (of oil imports as compared with 5 years ago)?

Answer: In 1980, total U.S. energy use declined 20 Quads as compared with what it would have been if the economic growth trend prior to 1973 had continued and energy prices remained constant at 1973 levels.

According to analysis performed by Oak Ridge National Laboratory, about half of this energy use reduction was due to slower economic growth. About 40 percent of the reduction was due to conservation measures undertaken in response to fuel price increases, and the remaining 10 percent reduction was due to Federal conservation programs and other factors.

If these factors had the same impact on oil use reductions as they had on energy use reductions, then conservation (price and other) would be responsible for about half of the oil import reduction and Federal conservation could be responsible for about 5 to 10 percent of this oil import reduction.

## Effect of DOE Programs on Conservation

Question: On numerous occasions you have stated that only 5 percent of the energy saved through conservation can be attributed to government programs, maintaining that 95 percent of the energy savings has been due to market factors such as increased prices. Could you tell the Committee who conducted this research and describe what methodology was used to arrive at this conclusion?

Answer: The study that is frequently cited to document that 5 percent of the energy reduction is due to the Federal conservation program is "Effects on Investment in Energy Conservation of DOE's Programs and of Market Forces" by Robert C. Marlay in the Office of Policy, Planning and Analysis, DOE (Staff Working Paper dated April 28, 1981).

Mr. Marlay notes that between 1973 and 1980, the energy use per dollar of GNP declined 13 percent. He calculates that this translates to about 12 quads in foregone energy use in 1980 (based upon 1973 efficiency levels).

Mr. Marlay attributes about 2 percent of the reduction to information and outreach programs. The remainder of the 5 percent is attributed to energy conservation tax credits. Both of these factor contributions are estimated by making assumptions about their effectiveness.

The remaining 95 percent reduction comes via the market. The largest part of the market effect is from curtailment in energy use, such as less miles traveled, lower thermostat settings, etc. The remaining part comes from fundamental improvements in energy efficiency, such as increase miles per gallon for autos, industrial efficiency improvements, etc.

## Cost of Oil Imports

Question: Can you provide the committee with information showing the savings, in dollars, as a result of lower oil imports compared with our expenditures on those imports five years ago?

Answer: In 1977 the average price of a barrel of imported oil was about $14.53. This led to an annual imported oil bill of approximately $42 billion. In 1981, the average price of a barrel of imported oil was approximately $37.00. Preliminary data indicates that the 1981 bill was approximately $76 billion. Because of the dramatic rise in the price of imported oil, the equally dramatic drop in imports has not led to any savings at all; rather it has contributed an annual increase of approximately $34 billion to the balance of payments deficit.

## Conservation Funding

Question: Studies by Oak Ridge National Laboratory staff indicate that even if the 5% figure were valid, the energy saved through conservation-oriented government programs would have the cost equivalent of $3 billion a year. In light of this cost savings, can you tell the committee why you propose to spend only $22 million on conservation for FY 1983?

Answer: What this says is that the Government has spent one dollar to save the private sector three. Return on investment is usually calculated on the basis of the investor reaping the benefit. It is precisely this "fantastic payback" that makes private sector investment in energy conservation so attractive. Particularly in view of the existing tax credits and other benefits, the private sector is expected to more than replace Federal spending in energy conservation.

## Tax Provisions

Question: The Administration has repeatedly justified cuts in nonnuclear energy programs on the grounds that oil price decontrol established a free market and that those free market forces alone would induce conservation. However, the Office of Management and Budget estimated that revenues lost to the Treasury because of special tax provisions for energy production exceed $7.4 billion in the Administration's proposed FY 83 budget while tax expenditures for energy efficiency investments are only $730 million. How do you reconcile your free enterprise philosophy with the fact that such tax code imbalances actually distort the marketplace?

Answer: Following reductions in energy tax credits the largest remaining tax items affecting the oil industry are the windfall profit tax, expected to raise $12-14 billion in fiscal year 1983 and tax benefits for oil producers worth approximately $7½ billion per year. It is a long run objective of this Administration to reduce government interference in economic activities. Consistent with this goal, the 1981 Tax Act scheduled some reductions in windfall profits taxes on oil producers to begin in 1983. Even after these scheduled reductions, the windfall tax collected from oil producers will far exceed the value of tax benefits to oil producers. The combined effect of special taxes and tax benefits focused on the oil industry is to raise tax burdens on that industry. Tax neutrality for oil producers will require further reductions of the tax burdens on that industry. Thus, the existence of tax benefits to oil producers does not necessarily represent an overall imbalance in oil producer taxation.

## Reorganization of Federal Energy Functions

Question: What is the status of the Administration's proposal to dismantle the Department of Energy?

Answer: The President announced his intent to reorganize Federal energy functions including the transfer of Department of Energy functions to other Federal Departments on December 17, 1981. The President's budget submission in February 1982 was consistent with his reorganization proposal. Currently a Task Force composed of concerned Federal organizations is preparing proposed legislation which will support the President's reorganization plans. This proposed legislation will be submitted when appropriate.

Question: Do you believe this action will result in cost savings? Can you provide the committee a detailed breakdown of where the savings would be realized as a result of the elimination of the Department of Energy?

Answer: We do believe the reorganization will result in cost savings but while dollar savings and staffing savings are expected, they are not as such the primary motivation for the reorganization of Federal energy functions. Rather, improved efficiency and effectiveness in accomplishing the energy role of Federal government will be achieved by consolidating energy functions in existing cabinet agencies. In particular, the reorganization will:

- improve the integration of energy policy into overall economic policy.
- maintain the synergistic relationship among energy research and development and defense programs and focus those activities in one integrated organization.
- place resource management functions in the agency primarily responsible for the stewardship, preservation, and development of the Nation's natural resources.

Steps have already been taken by the Administration to achieve a reorientation of energy pograms to emphasize long-term, high-risk energy research and development; national defense activities; and contingency planning for response to energy emergencies. There has been a concurrent reduction of subsidy programs for commercial production of energy technologies.

The fiscal 1983 budget for energy programs reflects both the reorganization of Federal energy programs and many programmatic adjustments responsive to the priorities set forth above. In preparing the staffing and funding requests in the budget, estimates were made of the resources needed to support the total program in the budget. Specific savings resulting from dismantlement per se cannot be separated from savings resulting from reductions in program activities, redirection of policy initiatives, overhead adjustments to reflect proposed program levels, and improvements expected in productivity and efficiency of operations. The funding and staffing levels for energy-related activities contained in the President's budget for fiscal year 1983 reflect all of the above actions including reorganization. It is not possible in this situation to isolate program reduction savings from reorganization savings.

It is important to recognize that beyond the short-term savings flowing from reorganization in fiscal year 1983 we can expect to realize continuing long-term savings from reduced overhead and more efficient use of resources. In fact, the consolidation of energy programs in existing agencies provides growing opportunities for additional savings in the future as the energy programs become fully integrated in their new environment and additional opportunities for sharing of systems and resources can be identified.

QUESTIONS SUBMITTED BY CONGRESSMAN RALPH S. REGULA

Weatherization Assistance Program

Question: In FY 1982 we provided $144 million for weatherization assistance grants. This program is zeroed in the FY 1983 budget request, however, $1.3 billion is included in the Department of Health and Human Services budget for Low Income Energy Assistance. Do you think it makes more sense to spend over a billion dollars every year to pay families heating bills, rather than investing a modest sum in a program that could make people capable of paying their own fuel bills by reducing heating costs?

Answer: The Administration believes State and local governments can best decide whether to spend funds on weatherization or fuel assistance for low-income. Most States will be providing weatherization services as part of the Department of Health and Human Services' (HHS) Low-Income Home Energy Assistance Program (LIHEAP). For FY 1982 and FY 1983 (assuming no statutory changes), HHS allows up to 15 percent of LIHEAP funds to be allocated by States for weatherization activities. If the FY 1983 budget request for LIHEAP is approved, this will potentially give States almost $200 million from HHS for weatherization assistance to low-income.

## Reorganization of Federal Energy Functions

Question: Your FY 1983 budget assumes abolition of the Department of Energy and a transfer of energy programs to various other departments. Since Congress created this cabinet level department, isn't Congressional action necessary to effect the reorganization you propose?

Answer: The Department of Energy (DOE) budget does assume a reorganization of Federal energy functions with the abolition of DOE and a transfer of energy functions to various other departments.

Over the years the budget has taken on increasing significance as a vehicle for presenting the President's program for the coming year to the Congress. Although sometimes the budget seems to take on a life of its own, in the end it is nothing more than a proposal which must be acted upon by the Congress. While DOE resources will be used to seek enactment of the budget as presented to the Congress, it is the Constitutionally-mandated process of enacting legislation which, in the end, will determine the final disposition of all the budget recommendations.

Merely printing a budget that assumes a successful reorganization of Federal energy functions, in our view, has no greater or lesser significance than printing a budget that shows an intention to reform the Food Stamp program, start production of the MX missile, or make any of the hundreds of other individual changes from prior policy reflected in the budget.

In view of the President's public commitment to reorganize the Federal energy programs of the DOE--announced first in his September economic message and restated formally in mid-December--for the submission of a budget to the Congress that showed the DOE continuing to operate into the indefinite future would send a misleading signal of lack of resolve and confidence to both the public and the Congress.

During the months between now and the start of FY 1983, when the budget would become effective if adopted by the Congress, we intend to advocate the merit of the proposals contained in the budget, including the reorganization of energy programs.

Question: Do you plan to submit legislation to accomplish the reorganization? If so, when?

Answer: With respect to legislation, it is our intention to submit legislation at the appropriate time to implement the President's proposed reorganization of Federal energy functions.

Question: What are the intended benefits of this proposed reorganization?

Answer: With respect to benefits of the reorganization, the transfer provides an opportunity to integrate more closely energy policy with general economic policy. The decision also recognizes that two-thirds of the Energy Department's functions consist of energy R&D and the weapons program. The move will put these activities in the Department with substantial experience in working with high-technology business. About 20 percent of Commerce's functions deal with research and development, and the Department has skills and resources to effectively oversee such responsibilities. The transfer also puts energy, an international growth business, in the Department responsible for promoting international trade.

Further, the proposed reorganization reflects this Administration's commitment to the principle that reliance on market decisions equips the Nation the best to meet its current and future energy needs. Consistent with this principle, the reorganization would preserve and, in some cases, enhance selected essential government activities related to energy while reversing the past trend of an expanding Federal role in the energy sector. The reorganization is designed to result in better management of government's essential responsibilities. These are: establishing sound public policies which give individuals and businesses the incentive to produce and use energy efficiently and allow an integrated energy market function; supporting national defense needs through civilian-controlled capability for research, design, production and testing in the area of nuclear weapons and devices; protecting against energy supply disruption through contingency planning and maintenance of a strategic petroleum reserve; supporting long-term, high-risk research on energy technologies and performing specific governmental tasks, where authorized, such as operation of the Naval Petroluem Reserve.

Question: Will there be any savings in administrative costs as opposed to anticipated savings from program reductions? If so, could you provide an account of these estimated savings.

Answer: With respect to administrative savings, there are significant changes in administrative funding from FY 1982 levels. Requested funding of $162.4 million is a reduction of $29.3 million (-15%) from the FY 1982 level of $191.7 million. The staffing request is for 2,341 total FTEs, a reduction of 2,045 (-47%) from the FY 1982 level of 4,386.

The administrative resource level changes must be reviewed in the context under which the total budget was formulated. The reductions correlate to both program reductions and the assumption that energy functions will be reorganized early in FY 1983. As such, administrative support requirements will be significantly reduced in FY 1983.

Savings will be derived from lower staffing needs in support services and policy functions due to overall program changes. Additional savings are expected to be derived from improvements in operational efficiencies when the DOE policy and support staffs are combined with those in the successor agencies. Economies of scale in operations should occur in several functional areas such as policy, controller, personnel and procurement functions. The lower staffing request reflects these savings in a total context.

In preparing the administrative funding requests in the budget, estimates were made of the resources neded to support the total program in the budget. Specific savings resulting from reorganization of Federal energy functions per se cannot be separated from savings resulting from reductions in program activities, redirection of policy initiatives, overhead adjustments to reflect proposed program levels, and improvements expected in productivity and efficiency of operations. The funding and staffing levels of energy-related activities contained in the Departmental Administration Budget for FY 1983 reflect all of the above actions including reorganization. It is not possible in this situation to isolate reorganization savings. An attempt to do so would have to be based on purely arbitrary factors.

Question: What would be the effect on your programs and budget if the reorganization is not accomplished?

Answer: With respect to the possibility that the President's reorganization proposal should be modified or not be accomplished, we would have to take another look at the budget to judge the impact. The examination would also have to take account of Congressional actions on the FY 1983 budget.

## Changes to Mandatory Programs

Question: A number of proposals assume changes in existing laws. For example, in the conservation budget the Building Energy Performance Standards and the Residential Conservation Service program are mandated by law. Do you plan to submit legislation to change these laws? What would be the effect on your budget if necessary changes in authorizing laws are enacted?

Answer: Congress often changes programs in the context of the budget process. As you know, we have made proposals to the Congress in the areas of conservation and renewable energy, believing that greater reliance is justified on the initiative of individuals, businesses, and others in the marketplace. I am confident that the proper scope and emphasis of Federal efforts in these areas during fiscal year 1983 will be clarified once Congress has acted on the Department's budget.

## Mining R&D

Question : Should the coal mining productivity and preparation R&D transferred to DOE in 1977 be returned to the Bureau? What will you do with the program? What will you do with the Pittsburgh and Carbondale mining facilities?

Answer: The DOE's position is that coal mining should be returned to the Bureau but preparation should remain with the DOE Fossil Energy program. Mining technologies relate to resource extraction and associated health, safety, and environmental concerns in the production of coal. Preparation technologies relate to economic and environmental concerns in the utilization of coal. Coal mining fits logically with other Bureau resource production programs. Coal preparation is an essential step in other coal utilization programs, i.e., combustion, coal water slurries, environmental control systems, and the like. It must remain an integral part of these other activities to ensure overall program success. Retention of coal preparation within Fossil Energy as an organizational entity is therefore crucial for a balanced utilization R&D program.

In keeping with this position, the DOE position on facilities is that all mining technology facilities at Carbondale and Pittsburgh should be turned over to the Bureau and that all preparation facilities at Pittsburgh would remain a part of the Pittsburgh Energy Technology Center in DOE.

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THURSDAY, MARCH 18, 1982.

# ECONOMIC REGULATORY ADMINISTRATION

## WITNESSES

**RAYBURN HANZLIK, ADMINISTRATOR, ECONOMIC REGULATORY ADMINISTRATION**

**MILTON C. LORENZ, ACTING SPECIAL COUNSEL, ECONOMIC REGULATORY ADMINISTRATION**

**JAMES W. WORKMAN, ACTING DIRECTOR, OFFICE OF FUELS PROGRAMS, ECONOMIC REGULATORY ADMINISTRATION**

**RICHARD T. TEDROW, DEPUTY DIRECTOR, OFFICE OF HEARINGS AND APPEALS**

## OPENING REMARKS

Mr. DICKS. This is the hearing on the fiscal year 1983 appropriation for the Economic Regulatory Administration and the Office of Hearings and Appeals.

The witnesses for the Economic Regulatory Administration are Rayburn Hanzlik, Administrator; Milton C. Lorenz, Acting Special Counsel; and James W. Workman, Acting Director, Office of Fuels Programs. The witnesses for the Office of Hearings and Appeals are George B. Breznay, Director and Richard T. Tedrow, Deputy Director.

We have biographies for the record and the statements may be placed in the record.

[The statements of Rayburn Hanzlik, George Breznay, their biographies and the biographies of Milton C. Lorenz and James W. Workman follow:]

### STATEMENT OF RAYBURN HANZLIK, ADMINISTRATOR, ECONOMIC REGULATORY ADMINISTRATION, DEPARTMENT OF ENERGY

Mr. Chairman and members of the committee, I appreciate the opportunity to appear before you today in support of the President's fiscal year 1983 budget request for programs currently administered by the Economic Regulatory Administration. While this budget reflects the President's proposal to reorganize the Department of Energy, my comments also apply to these programs as administered under the present DOE organization. The programs involved are basically self-contained activities, which can properly function intact before and after reorganization.

The programs addressed in the fiscal year 1983 budget include: the Oil Pricing and Allocation Enforcement Program; the Oil and Gas Programs; and, the Fuels Conversion Program. The total budget request in fiscal year 1983 is $16.4 million, of which $13.5 million is for the Enforcement Program.

#### ENFORCEMENT PROGRAM

The Enforcement Program in fiscal year 1983 will essentially involve the litigation of cases for alleged oil pricing violations not resolved during fiscal year 1982. The program in fiscal year 1982 consists of the completion of audit files for all unfinished enforcement cases, the resolution of these cases through negotiated settlements, and the preparation of cases not settled for litigation. All cases not resolved by September 30, 1982, will be subject to administrative and judicial litigation under this budget request.

We anticipate at this point that at least three-quarters, and hopefully more, of the approximately 850 unfinished cases will be resolved by the beginning of fiscal year 1983. Most of the fiscal year 1983 caseload will involve smaller companies, with only two or three major refiner cases unresolved. The budget request makes more than adequate provision for the personnel resources needed to properly litigate the caseload carried into fiscal year 1983.

The 13.5 million requested will fund the oil pricing litigation. This work will be handled by the experienced enforcement attorneys and litigation support personnel now employed in the ERA enforcement program. Additional attorneys and support personnel will be available from the Office of General Counsel under a separate budget request.

This enforcement litigation work will be the final activity of the former pricing and allocation regulatory program. The litigation work will transfer to the Department of Justice under the President's reorganization plan. If this transfer does not occur by October 1, 1982, the litigation will continue to be handled within the Department of Energy.

### OIL AND GAS IMPORTS

These programs include the Oil Import Program and the Natural Gas Program. The Oil Import Program involves the licensing of all imports of crude oil, unfinished oils, and finished petroleum products. The Natural Gas Program administers the licensing of gas imports and exports. The funding request for these programs is $2.3 million, a decrease of $.3 million from fiscal year 1982.

### FUELS CONVERSION

The Fuels Conversion Program in fiscal year 1982 was continued under the authority of the Fuel Use Act, as amended by the Omnibus Budget Reconciliation Act of 1981. The amended Act provides for federal administrative assistance to utilities wanting to convert from oil and natural gas to coal fuel through a prohibition order process. The Administration has not proposed funding in fiscal year 1983 for this program on the basis that the work should be completed by the end of this fiscal year. In the event that essential work in the program remains in fiscal year 1983, a budget adjustment for fuels conversion will be considered by the Administration.

This concludes my statement. I will be happy to answer any questions at this time.

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## STATEMENT OF GEORGE B BREZNAY, DIRECTOR, OFFICE OF HEARINGS AND APPEALS, DEPARTMENT OF ENERGY

Mr. Chairman, members of the Committee, I appreciate the opportunity to appear before you today to discuss the operations of the Office of Hearings and Appeals.

As I reported to you last year, the January 28, 1981 Executive Order decontrolling crude oil and petroleum products very substantially changed the operations of the Office of Hearings and Appeals. Because of the Executive Order and the steps which we took to adapt our operations over the last 12 month period we resolved 6,301 open and new submissions in this period and reduced inventory by 82 percent. I believe that this is a substantial accomplishment. In addition, during 1982 the operations of the Office of Hearings and Appeals are being conducted at a funding level which is 43 percent below its 1981 fiscal year appropriation.

As of the end of January, we reduced our open caseload to 651 petitions. Nevertheless, we understand that the planned operations of the Economic Regulatory Administration will produce approximately 965 new Proposed Remedial Orders during the remainder of this fiscal year. These proposed orders, together with our other cases and the related submissions which remedial actions historically produce, can increase our caseload by as many as 4,750 submissions. On the basis of this guidance we can project opening the 1983 year with an inventory as high as 3,860 cases. Significantly, the bulk of this inventory will consist of compliance-related filings—which are historically the most vigorously contested becasue of the money involved and consequently the most difficult and time consuming to resolve.

As you know, our request is for a staff of 122 persons—as appropriate staffing level in view of the workload involved.

The statistics which we have provided project the resolution of 2,010 submissions during 1983. This means that a substantial number of cases could remain unresolved at the conclusion of fiscal year 1983, and the budget accordingly assumes continuation of the program in fiscal year 1984. I emphasize that the compliance cases which we anticipate receiving cannot be dealt with in either a summary or expedited manner. There are procedural rights and time periods involved which entail that a period of at least 60 calendar days will elapse following the issuance of a Proposed Remedial Order before OHA may begin to resolve a case. The filing of motions and other sumissions will only lengthen this period. In addition, we are likely to receive enforcement cases raising issues of first impression. Experience is essential in dealing with the complicated issues these cases present. For these reasons, I do not believe that any additional staff positions would lead to an appreciably greater number of case resolutions during the coming fiscal year. In fact, if we were to devote the time of experienced professional staff to train new hirees it would almost certainly reduce case resolutions during the first three to six months of the year.

This concludes my prepared presentation. I would be pleased to respond to any questions which you might have.

## INPUT/OUTPUT FISCAL 1981-82

Headquarters Office of Hearings and Appeals

| Month | Beginning inventory | Receipts | Final decisions and orders | Proposed decisions and orders | Administrative closings | Total determinations | Ending inventory [1] |
|---|---|---|---|---|---|---|---|
| February | 1,613 | 111 | 121 | 30 | 639 | 790 | 964 |
| March | 964 | 160 | 143 | 34 | 86 | 263 | 895 |
| April | 895 | 84 | 145 | 14 | 35 | 194 | 799 |
| May | 799 | 93 | 103 | 48 | 31 | 182 | 758 |
| June | 758 | 73 | 112 | 7 | 24 | 143 | 695 |
| July | 695 | 65 | 74 | 5 | 12 | 91 | 674 |
| August | 674 | 80 | 62 | 10 | 12 | 84 | 680 |
| September | 680 | 169 | 54 | 9 | 9 | 72 | 786 |
| October 1981 | 785 | 54 | 55 | 4 | 24 | 83 | 760 |
| November | 760 | 72 | 58 | 8 | 20 | 86 | 754 |
| December | 754 | 36 | 74 | 7 | 17 | 98 | 699 |
| January 1982 | 699 | 33 | 65 | 40 | 16 | 121 | 651 |
| Total |  | 1,030 | 1,066 | 216 | 925 | 2,207 |  |

[1] Includes cases for which proposed decisions and orders have been issued but not yet finalized.

### BIOGRAPHY OF RAYBURN HANZLIK

Rayburn Hanzlik was nominated by the President on June 23, 1981, and confirmed by the Senate on September 21, 1981, as Administrator of the Economic Regulatory Administration, U.S. Department of Energy (DOE). In this position, he is responsible for the enforcement and administration of the Department's programs concerning petroleum pricing and allocation, oil imports and exports, the utilities, and fuel conversion.

Mr. Hanzlik is an attorney, broadly experienced in Government as well as private law practice. He has served as legal adviser for an Alaskan oil refinery project (1977-80) and counsel to the Japanese Government on U.S. nuclear energy policy (1977-78). Positions which he has held include self-employed attorney and counsel to the law firm of Darling, Rae, and Gute, Los Angeles (1979-80); attorney with Akin, Gump, Hauer and Feld, Washington, D.C. and Dallas, Texas (1978-79); counsel to Danzansky, Dickey, Tydings, Quint and Gordon, Washington, D.C. (1977-78); Associate Director for Intergovernmental Relations, White House Domestic Council (1976-77); Staff Director, Public Forums on Domestic Policy, Office of the Vice President (1975-76); partner, Robert Finch and Associates, Los Angeles and Washington, D.C. (1974-75); junior partner, E. Del Smith and Company, Washington, D.C. (1973-74); Staff Assistant to the President (1973); Executive Assistant to Counselor to the President, Robert H. Finch (1971-73); and Director, 1971 White House Conference on Youth (1970-71).

He received a B.S. degree from Principia College; an M.A. degree from the Woodrow Wilson School of Government and Foreign Affairs, University of Virginia; and a J.D. degree from the University of Virginia School of Law. Mr. Hanzlik is a graduate of U.S. Naval Officer Candidate School and the Armed Forces Air Intelligence Officer School. He is a decorated Vietnam veteran.

Active in the Republican party, Mr. Hanzlik was a candidate for the Republican nomination in California for the U.S. Senate in 1980. He also served as Director of the California Republican Victory Fund in 1980 and was an alternate delegate (California) to the 1980 Republican National Convention. Mr. Hanzlik is a member of the Virginia, American, and District of Columbia Bar Associations. He has authored, edited and contributed to serveral publications.

Mr. Hanzlik was born in Los Angeles, California. He is married to the former Susan Evans of Tulsa Oklahoma. They have four children.

### BIOGRAPHY OF JAMES W. WORKMAN

Mr. Workman is Director of the Office of Fuels Programs within ERA. As such he is responsible for managing all ERA non-enforcement programs: i.e., Fuels Conversation, Oil Imports, Gas Import/Exports, Entitlement close-out activities.

James W. Workman served as Director, Utility Systems and Emergency Communications Division (USEC), Office of Emergency Operations, within the Office of Environmental Protection, Safety, and Emergency Preparedness (EP), U.S. Department of Energy (DOE). He also serves as Director of the Division of Powerplants Conversion, Office of Fuels Conversion, Economic Regulatory Administration (ERA).

As Acting Director of USEC, Mr. Workman is responsible for DOE emergency operations related to electric utilities and for maintaining an emergency communications network that emcompasses all DOE emergency activities. In his position as Director of Powerplants Conversion, Mr. Workman is responsible for DOE Activities related to utility conversions from oil to coal burning.

Prior to this current appointments, Mr. Workman served as Deputy Director of ERA's Division of Power Supply Reliability. In that position, he managed programs designed to ensure adequate and reliable bulk power supply systems, coordination of Federal electricity emergency activities, increased efficiency of electricity production and use, the introduction of new technologies, and the availability of coal and nuclear powerplants.

Mr. Workman joined the Federal Government in 1961. His public service includes appointments with the U.S. Department of Defense, the U.S. Department of the Interior (DOI), the U.S. Energy Research and Development Administration (ERDA), as well as the DOE. At DOI, he served as Power Adviser to the Assistant Secretary for Water and Power and later on the staff of the Assistant Secretary for Energy and Minerals. He was Assistant Director for Planning in ERDA's Division of Electric Energy Systems and served as senior utility analyst on the ERDA Administrator's staff. Mr. Workman also served for a period in DOE's Office of Energy Research.

He received a bachelor's degreee from the Virginia Polytechnic Institute in electrical engineering and a master's degree in engineering administration from the George Washington University.

Born in Los Angeles, California, Mr. Workman currently resides in Northern Virginia.

### BIOGRAPHY OF MILTON C. LORENZ

Milton C. Lorenz of Dallas, Texas was appointed Special Counsel for the Economic Regulatory Administration (ERA), Department of Energy, in December, 1981.

Mr. Lorenz is a 41-year old attorney with broad experience in private and government legal practice. He is a leading specialist in federal oil pricing enforcement law and has, most recently, been Chief Counsel in the Southwest District Office of the Energy Department. As Special Counsel, Mr. Lorenz is responsible for directing the government's oil pricing enforcement program. His duties include management responsibility for the ERA field office operation.

Mr. Lorenz began his federal service in 1975 as an attorney-advisor for the Bureau of Hearings and Appeals in the Department of Health, Education and Welfare's Denver office. In 1977, he transferred to the Federal Energy Administration (later the Department of Energy) as Assistant Regional Counsel for the Rocky Mountain Region.

Prior to beginning federal sevice, Mr. Lorenz was in private law practice in Denver, where he simultaneously served as Supervisory Attorney for the Criminal Defender Program and Director of the Mexican American Law Student Association Defender Program at the University of Denver.

Mr. Lorenz obtained his law degree from Tulane University in 1973. For seven years prior to law school, he served as an officer in the U.S. Army Corps of Engineers based in New Orleans, Louisiana. He was born in New Orleans on August 9, 1940.

### REORGANIZATION

Mr. **Hanzlik**. This hearing concerns the appropriation for the Economic Regulatory Administration. My comments today reflect the President's proposal to reorganize the Department of Energy, but they also apply if this reorganization does not take place as is proposed, as these programs are basically self-contained activities which will continue irrespective of what happens to the Department of Energy.

We don't have the problem some of the other programs in the Department have in terms of what happens if the DOE is reorganized. We will be kept intact in both cases.

Mr. **Dicks**. Where would you go?

Mr. **Hanzlik**. In the case of the compliance program, the President's proposal has the program moving under the jurisdiction of the Department of Justice, and other programs would be in Commerce.

It is our current thinking that they would remain programmatically intact, run essentially by the same people under the same budget proposals.

The compliance program, the main activity of the Agency now, would in fiscal year 1983 essentially involve oil pricing violations not resolved during this fiscal year.

Mr. **Dicks**. Wait a minute. I thought they are all going to be resolved this year.

### THE COMPLIANCE PROGRAM

Mr. **Hanzlik**. They will be resolved to the extent they will either be negotiated settlements or they will be put into litigation. They will be resolved from the standpoint of investigations, the audits, preparation for litigation. Cases which we are not able to settle will go automatically into litigation. Therefore, no single case will be left unresolved from this Agency's standpoint.

Our program right now is to get the pending case load in that status, settling as many cases as we can this year. Those we are not able to settle, normally because of lack of cooperation from the companies, will be litigated this year as well as next and as long as it takes.

Mr. **Dicks**. Litigation could take a long time. How many of these have you resolved so far?

Mr. **Hanzlik**. What period of time?

Mr. **Dicks**. Since the problem began.

Mr. **Hanzlik**. I do not have that information here but will get you that number.

Mr. **Dicks**. Weren't you working with the majors companies last year?

Mr. **Hanzlik**. There were 35 major companies. We have settled 21 of them, 18 of which have been announced. We have another three in the final process of review and should be announced in the next few weeks. We have 14 remaining major companies, virtually all of which are now in settlement negotiations.

Mr. **Dicks**. How have we done on the 21 settlements? How much have we recovered?

Mr. HANZLIK. We have recovered from the majors, approximately $600 million in cash. In the program previously, the numbers reflected a number of credits to the companies—banks, investments and so forth. But we are only concerned about the hard dollars that we can collect.

Mr. DICKS. What are you going to do with the money?

Mr. HANZLIK. It is a case-by-case situation. In cases where we can identify the specific parties that were overcharged, the money goes back to those particular customers. Where it is impossible or impractical to identify the specific customers, the money has either gone into an escrow account for future disposition, to the U.S. Treasury, or to the Strategic Oil Reserve.

Mr. DICKS. How much is in escrow now?

Mr. HANZLIK. About $440 million is currently in the Federal Deposit Fund Escrow Account. This amount includes about $56 million in interest that has accrued. Approximately half of this money is before the Office of Hearings and Appeals for administrative adjudication of claims.

Mr. DICKS. Last year in our hearings I asked a question:

> Is that why we call them the gross estimates?
>
> Mr. HOUSE. This is a gross figure of approximately $2.3 billion in the Office of Enforcement, and about $8.3 billion in the Office of Special Counsel.
>
> Mr. DICKS. What is that now?
>
> Mr. HOUSE. $2.3 billion gross in the Office of Enforcement and $8.3 billion gross in the Office of Special Counsel. Now the net violations, we would expect—after mitigating factors like improper costs identified by audit do not actually passed through to consumers, et cetera, bank reductions that no longer exist because controls have gone away—we figure that the adjustment would be between $4 and $5 billion for the Office of Special Counsel, and $1.6 billion to $1.8 billion for the Office of Enforcement.

Now it doesn't sound to me like we are getting anywhere near those numbers.

Mr. HANZLIK. I think he was making a projection, is that correct?

Mr. DICKS. Yes.

Mr. HANZLIK. You asked what we had accomplished.

Mr. DICKS. Yes. The way I always do business is you look at what the projections were, then you look to what the accomplishments are. Then you decide whether you did a very good job or not.

Mr. HANZLIK. Of course, this is an 8-year old program, and the numbers I gave you reflect the work since the last hearings as well as the previous years.

Mr. DICKS. Right.

Mr. HANZLIK. I do not know and have been unable to determine how he calculated those numbers.

Mr. DICKS. Did you ever ask him?

Mr. HANZLIK. No, I have not. I have the same staff that he had.

Mr. DICKS. How would you find out if you didn't ask him?

Mr. HANZLIK. Well, I do know that one can come up with any number one wants in this program because of its complexity.

Mr. DICKS. We are just worried that we are not getting a vigorous enforcement effort because the budget does not reflect a vigorous enforcement effort. That is what we are worried about.

Mr. HANZLIK. I read that in the previous hearings record, and I appreciate your position. I am curious as to why anybody would come to that conclusion because the dollar amount should not be a measure of whether it is vigorous or not. The dollar amounts reflect any number of problems, not the least of which are the legal difficulties that we have in some of these cases.

### PROJECTIONS OF ALLEGED VIOLATIONS

Mr. DICKS. What is your current estimate of the gross dollar value of alleged overcharge cases? If you don't like Mr. House's, why don't you give us your gross estimates.

Mr. HANZLIK. I want to be very clear on one point which I know was debated substantially in last year's hearing. There have been numbers that have been utilized, anywhere from $10 to $13 billion of alleged violations. Alleged violations are like alleged tax violations, in the world of income taxes, such as alleged deductions violations on your income tax form. These violations have little relationship to the dollars we are talking about. They are regulatory violations that apply to the calculations of the money we are trying to collect. Now, I will give you a number but this should not be equated in any sense with the money we are talking about. There are approximately $8.8 billion in alleged cost violations we are processing right now.

Mr. DICKS. $8.8 billion?

Mr. HANZLIK. $8.8 total in the whole program. These are cost violations.

Mr. DICKS. How does that estimate differ from last years estimates?

Mr. HANZLIK. I don't have that figure in front of me.

Mr. DICKS. Last year it was $10.6 billion?

Mr. HANZLIK. That is right.

Mr. DICKS. So you have come down from $10.6 billion to $8.8 billion?

Mr. HANZLIK. If the $10.6 billion was calculated on the same basis as our $8.8 billion, this would tell you we have resolved approximately $2 billion in violations.

Mr. DICKS. What did you collect on the $2 billion?

Mr. HANZLIK. On the $2 billion? I will give you our exact numbers for this past year if you will bear with me for a second; I have a lot of data in front of me. During fiscal year 1981, Mr. Chairman, we collected approximately $286 million in hard dollars. There were other credits given for bank adjustments and investments and so forth, but we are now only concerned about the hard dollars because we no longer are including these credits. There was justification for these while the regulations were in effect. We are only interested now in extracting the actual amount of money overcharged the public for a particular product. That is the money the program has historically been collecting.

I looked at the history of the program to try to find out what are the hard dollars that historically have been collected from settlements versus the alleged violations. In other words, when there are $10 billion of alleged violations, what is the money we are collecting, how does that translate into hard dollars?

Historically, somewhere around 13 percent of a violation is the hard dollars that we have received either in litigation or in case settlements.

Mr. **Dicks**. It is hard to get money back from the oil companies, is that what you are telling me?

Mr. **Hanzlik**. No, I do not think you understand.

Mr. **Dicks**. Well, you make me understand.

Mr. **Hanzlik**. I read through your last hearing record on this and they tried to explain this then. I sensed from the debate the difficulty of understanding this important point.

Mr. **Dicks**. Well, you explain it then. Let me go vote and then I want to hear your explanation.

Mr. **Hanzlik**. When you get back I will explain and you will understand and everybody in this room will understand.

[Recess.]

### ALLEGED VIOLATIONS VS. SETTLEMENTS

Mr. **Dicks**. The committee will come to order.

Go ahead.

Mr. **Hanzlik**. I am going to use an example. Let's use the internal revenue income tax problem. I will use Mr. Lorenz as my example. He goes home tonight and finds a letter from the IRS in the mail stating: Mr. Lorenz, we have been auditing your tax returns for 1980 and we find what appear to be $2,000 in deductions that you have claimed improperly. Would you please come in, bring your records and cancelled checks. Mr. Lorenz says fine, I have all these records and I think I can substantiate it. He wakes up tomorrow morning and in the Washington Post on the front page is a headline that says "Special Counsel Allegedly Has $2,000 Tax Violation." Everybody thinks Mr. Lorenz has cheated the Government $2,000. He meets with the IRS and goes over his records. They get more information and confirm that he is essentially right. Most of the deductions are legal, but there is $100 that cannot be verified. Mr. Lorenz agrees that he does not have the supporting data. So, the IRS asks if he agrees that he has a $100 deduction that shouldn't have been claimed? Mr. Lorenz says yes. Then the IRS calculates his tax and he owes $25. Mr. Lorenz writes the IRS a check and the problem is settled.

The next day in the paper it says, "Lorenz settles $2,000 tax violation for $25." People ask what happened to the other $1,975? Now the oil refinery audits are very similar. We go in and audit a very complex set of transactions and we find regulatory violations.

### STATUS OF AUDITS

Mr. **Dicks**. Who does the auditing?

Mr. **Hanzlik**. We have a team of Government auditors.

Mr. **Dicks**. Are any of those people here today?

Mr. **Hanzlik**. No, sir. Most of them are in our eight field offices. Part of the auditing was done by major auditing firms on contract.

Mr. **Dicks**. Who were the auditing firms for the record? You can put that in the record?

Mr. **Hanzlik**. Alexander Grant. But these contracts are over. In fact the audits for the major refineries are all completed.

Mr. **Dicks**. All 35?

Mr. **Hanzlik**. Yes, sir. We have about 300 auditors still in the Agency working on other audits.

Mr. Dicks. You still haven't finished the smaller cases?

Mr. Hanzlik. We have about 160 incompleted audits, half of which are being held up by subpoenaes against companies that are resisting audits.

The Justice Department has the responsibility for enforcement of the subpoenaes. Except for these, we will have all audits completed very shortly. The auditors are also in the process of their analysis—which in the major refineries is a 2- or 3-year program—to determine the number of specific violations in their audited transactions, which are then computed together to determine how much a company overcharged for a particular product. The amount of violations they find may or may not have any direct relationship to the price charged.

I have faulted the Department for giving broad visibility and publicity to these cost violations because people equated these numbers to the actual overcharges. The two are not the same. Just like the man who had a $2,000 tax deduction violation alleged but only $25 in actual tax violation.

The same situation works in these major refinery cases.

Mr. Dicks. Let's talk about this little bit. Tell me what are these overcharges?

Mr. Hanzlik. I will ask Mr. Lorenz who is our major refinery expert to explain this. He is familiar with these audits and has settled a number of these cases. I think he can give you the specific walk through of a major refinery audit and demonstrate how a large alleged violation would result in a smaller dollar overcharge.

Mr. Lorenz. Good morning, Mr. Chairman.

My name is Milton Lorenz, the Acting Special Counsel in ERA. As Mr. Hanzlik has explained, the notion of alleged violations, very much of which——

Mr. Dicks. Do you say alleged all the time? I am a lawyer but why do you say alleged?

Mr. Lorenz. Because it is not yet adjudicated and proven. This is much as you would file a complaint in Federal District Court alleging damages in a large amount.

Mr. Dicks. All right.

### EXAMPLE OF AUDIT

Mr. Lorenz. I would like very simply and perhaps quickly to walk you through a basic calculation.

Mr. Dicks. Let's walk.

Mr. Lorenz. The formula itself is much, much more complex than what you will hear at this point. But the program, as you will recall, was a cost-based program. It started with the prices charged to customers on May 15, 1973. Refiners, for instance, were only allowed to increase their sales prices to the extent that they had costs, costs such as crude oil and refinery labor, et cetera—only to the extent that they had increases in costs since May 1973 could they raise prices.

So, we can look at a very simple example, some refiner who had only one gallon of sales, the very simplest kind of figures.

Mr. Dicks. I can handle that one. All right.

Mr. LORENZ. I feel that way myself. In May 1973, if a refiner had been charging 20 cents per gallon for some gallon of gasoline, and now we are checking to see what his compliance level was for 1978. The refiner claims, and had filed forms certifying to 50 cents in increased costs. Therefore, his apparent maximum allowable price would have been 70 cents in 1978 for that gallon of gasoline.

To the extent that his costs as claimed were correct, there would be no problem if he charged something less than 70 cents. Most refiners were charging less than what their claimed cost increases would have shown as a maximum allowable price. This refiner, for instance, may have charged 60 cents per gallon, 10 cents under what he said his maximum allowable sale price was. He would then show a 10-cent underrecovery, indicating that he did not recover all of his cost increases. That 10 cents could then be saved, or banked. It could be used for next month. Our audit staff comes along and, assuming they are correct, there are 12 cents in cost violations. This is the kind of figure one would see in a notice of probable violation, which is an indictment of sorts, it would say 12 cents of the costs are not supportable and not allowed under the regulations.

Well then, if we backed off——

Mr. DICKS. But some part of that 12 cents might be?

Mr. LORENZ. Some part could have been.

Mr. HANZLIK. He is saying of the 50 cents, 12 cents was not allowed.

Mr. LORENZ. Then the refiner comes back to us and shows us that there are offsets here; in other words, these are some additional costs not otherwise claimed. This is much the same as a tax audit situation where sure they got you on charitable deductions, but you forgot to claim some medical expense that you could have claimed.

Perhaps 2 cents of the 12 cents could have been an offset. So, the net cost violation, which the public may not know because it is developed in the process of negotiations, is 10 cents. Subtracting the 10 cents from the claimed 50 cents of cost increases means the refiner gets to add only 40 cents to its May 1973 sales prices, and so, the real maximum price was not 70 cents but 60 cents. Now if the refiner only charged 60 cents, there would be no overcharge violation. If the refiner had charged 62 cents, there wouldn't have been an 8 cent bank or underrecovery, but rather a 2 cent overcharge. In that scenario the original 12 cents in alleged cost violation became 2 cents in overcharge violation.

### COMPLEXITY OF SETTLEMENTS

Mr. DICKS. Do you have a synopsis of each of these settlements?

Mr. LORENZ. A synopsis of the violations?

Mr. DICKS. Yes. In other words, something for us, the Congress, to use in determining whether you have done a good job on this or not. That is what I am trying to find out. Whether we are protecting the public interest. Could you give us a synopsis of each of these settlements?

Mr. LORENZ. It is a very complex——

Mr. DICKS. I know. I know. But you laid it out here rather specifically. It shouldn't be that hard to do. There were some settlements made and you are saying there are puts and takes, fine. I would like a synopsis of each of those settlements for the record. What the potential cost violation was, and what the adjustments were that took you down to the settlement figure. That should be easy to do, shouldn't it?

Mr. LORENZ. It is not so easy as it may sound because what——

Mr. DICKS. I knew it wouldn't be.

Mr. LORENZ. If it were that easy we would have been finished with the program years ago.

Mr. DICKS. But you made settlements. You are saying to me you are getting 16 to 17 cents on the dollar, isn't that what you said?

Mr. LORENZ. I think it is not that easy because the puts and takes, as you put it, are not so clear. For instance, this 12 cents could have been made up of seven violations. Take out one of the violations, which of the 12 cents was 3 cents, and the net difference by the time one goes through the very complex formula of calculating month by month may not be 9 cents; it may be 7 cents. Then, if you throw in two or three additional kinds of violations, each of which change the net by more than their constituent contribution to the 12 cents——

Mr. DICKS. But there ought to be a way to summarize this. You are talking about billions of dollars. We have given you a lot of money and you haven't even spent it all. Do you want the GAO to do it or the Survey and Investigations staff of the Appropriations Committee to come over and do it for you? I think you owe it to the American people, because there is suspicion about how vigorously this is being pursued.

It just seems to me that one way to overcome that perception is for you to substantiate how you reach these agreements. I think the public has a right to know that. You are talking about billions and billions of dollars of potential overcharges, and I, for one, would like to know how you got there; where you started from and how you resolved each of these cases. It shouldn't be that difficult to summarize it.

Mr. LORENZ. It may not be very difficult to summarize it except that the process of evaluating a major refiner case with, perhaps 30 or 40 issues in various time periods, assigning some risk of litigation—for instance, the example I just gave in which there is a 2-cent apparent overcharge, that 2 cents cannot be collected in litigation unless we win on the underlying cost issue. If there are three underlying cost issues, each of which contributes some different share, and if you lost any one of them and thereby drop your apparent cost violation by 2 cents or more, we would have nothing in that case.

Mr. DICKS. But you had really good auditors doing this work, the people who reached the judgments that there were violations weren't amateurs.

Mr. HANZLIK. One of the problems is alluding to——

Mr. DICKS. I am going to have to leave again. I have 5 minutes to make a vote. Unfortunately, we are going to have a series of votes. The committee will be in recess for about 25 minutes if you want to go get a cup of coffee. I do not think we will get started again until probably 11 o'clock.

[Recess.]

Mr. DICKS. Okay, let's go back.

What we decided is that we will ask you for a summation of the major cases but not for the other ones unless there is a substantial amount of money and we can work that out.

[The information follows:]

### MAJOR REFINER SETTLEMENTS

A summary of major refiner settlements, including the remedial provisions provided for in each such settlement, is set forth in Appendix A. A listing of all enforcement documents issued against the major refiners is set forth in Appendix B.

## APPENDIX A

### SUMMARY OF CONSENT ORDER REMEDIES
AS OF MARCH 19, 1982

| | Summary | Refunds | Price Reductions | Escrow, Claims & Subpart V | Strategic Petroleum Reserve | Investments | Reduction Bank Component |
|---|---|---|---|---|---|---|---|
| KERR-McGEE | $46 million Cash | | $691,000.3 cents per gallon to gasoline retail customers<br>$45,309,000.3 cents per gallon to certain purchasers of Kerr-McGee products | | | | |
| CITIES | $30 million Cash<br>$147 million Bank Reduction | | $20 million. 3 cents per gallon to No. 2 diesel fuel and No. 2 heating oil customers | $10 million claims fund | | | $132 million from gasoline<br>$15 million from propane |
| PHILLIPS | $25 million Cash<br>$75 million Bank Reduction<br>$100 million investment | $3 million Crude Oil purchasers<br>$22 million crude oil purchase for refinement into heating oil and purchase of middle distillates to be sold at a fixed price to preclude recovery | | | | $100 million Exploration & enhanced recovery<br>Desulphurization<br>Heavy oil refining | $67.5 million from gasoline<br>$7.5 million from propane |
| | | $25 million | $66 million | $10 million | | $100 million | $222 million |

|  | Summary | Refunds | Price Reductions | Escrow, Claims & Subpart V | Strategic Petroleum Reserve | Investments | Reduction Bank Component |
|---|---|---|---|---|---|---|---|
| HESS | $35 million Cash<br>$100 million Bank Reduction<br>$400 million Inv. | $5 million-State & Local Governments<br>$27 million-Utilities<br>$3 million-Defense Fuel Supply Center |  |  |  | $400 million Exploration Expansion:<br>Refineries<br>Storage<br>Transp. | Gas ($100,000,000) |
| ASHLAND | $25 million Cash<br>$650 million Bank Reduction | $6.1 million Utilities, Transportation and Residential Customers |  | $18.9 million-60 day claims fund for gas resellers. |  |  | Gas to $75 million<br>propane to $7.5 mill.<br>($650 Million) |
| CHARTER | $28.2 million Cash<br>$62 million Bank Reduction | $25 million to Utilities.<br>$15 million within 60 days<br>$3,333,333 each Quarter |  | $3.2 million (Subpart V) |  |  | Gas to $40,880,000<br>($62 million) |
| COASTAL | $17.5 million Cash<br>$300 million Bank Reduction | $12.5 million to Utilities & Transportation customers |  | $5 million 12 month Claims fund |  |  | Gas to $75 million<br>Propane to $25 Mill.<br>($300 Million) |
|  |  | $78.5 million |  | $27.1 million |  | $400 million | $1,112 million |

## ESTIMATED SETTLEMENT AMOUNT

Mr. DICKS. We discussed your current estimate of the gross dollar value of alleged overcharged cases. Of this amount, what proportion do you think will eventually be recovered? We have $600 million.

Mr. HANZLIK. Actually, Mr. Chairman, the program to date has collected about $1.1 billion, with $600 million for the major refineries.

Thus, double that amount has come from the program. I want to keep that fact clear for the record.

Mr. DICKS. Yes.

Mr. HANZLIK. It is literally impossible to give you any accurate estimate. I will give you an example as to why. We are in litigation right now with a major refinery on a single case which is in the neighborhood of $800 million if the Government wins the case; and, of course, if we lose it, we lose that amount of money. So it is a swing there of $1.6 billion.

Mr. DICKS. Which refiner is that?

Mr. HANZLIK. It is Exxon.

Mr. DICKS. I have heard of them.

Mr. HANZLIK. I use that as an example to illustrate the difficulty in estimating future collections. We anticipate that we will recover somewhere between $1 and $2 billion in the remaining cases that we have.

Mr. DICKS. $1 and $2 billion on the remaining cases?

Mr. HANZLIK. $1 and $2 billion with the remaining cases.

Mr. DICKS. Does that include the $800 million that is in litigation?

Mr. HANZLIK. Yes, that is part of that.

Again, I indicate there is the possibility of a large swing there. When we make our estimates we factor in what we think percentages are for cases in litigation.

Mr. DICKS. Yes. I am just asking for an estimate. I know you are going to want to be careful.

Mr. HANZLIK. The other point I want to make is that we have 540 companies left in our inventory with approximately 820 cases.

Now, 93 of those cases are major refinery cases, so you can see the bulk of the inventory are smaller companies. Since it is the final phase of this program, the easy cases, the clear cases have been, in most instances, resolved.

We are now down to the residue of the program, which includes the tough cases, the companies that have been historically more resistant to cooperating with us.

What we are facing now is the toughest part, in some respects, of the program.

Mr. DICKS. Well, then, why are we cutting the program back?

Mr. HANZLIK. The program was funded at such a high level previously because of the enormous amount of audit work that had to be done. That work will be complete this fiscal year. Once the audit work is over and the files complete, then the work remaining is to litigate.

Mr. DICKS. Negotiate and then litigate?

Mr. HANZLIK. Our policy is that we are going to negotiate this fiscal year and for companies that are not willing to negotiate and try to work out their problems, we are going to put their cases in court and resolve them there.

Mr. DICKS. In October of this coming year?

Mr. HANZLIK. Yes, that is the deadline.

Mr. DICKS. In October 1982, if they have not negotiated a settlement, then we are going to turn it over to the Justice Department to litigate?

Mr. HANZLIK. Well, what we will do is go through our normal litigation procedures. Our attorneys will still be active in 1983.

The cases go through the Office of Hearings and Appeals, the beginning of a long litigation process.

### OFFICE OF HEARINGS AND APPEALS WORKLOAD

Mr. DICKS. Based on monthly reports to the committee from the Office of Hearings and Appeals, the compliance workload is simply not developing. Using ERA projections, Hearings and Appeals had anticipated receiving 4,420 new filings in fiscal year 1982.

From November 1981 through January 1982, Hearings and Appeals received only 137 cases, including noncompliance cases.

First, will you explain the basis of the estimate of 4,420 new filings with Hearings and Appeals for fiscal year 1982?

Mr. BREZNAY. That is my number, Mr. Chairman. Ray can take a crack at it.

Mr. DICKS. What is your name?

Mr. BREZNAY. I am George Breznay, Director of the Office of Hearings and Appeals.

Mr. DICKS. Do you want him to respond?

Mr. HANZLIK. Yes, he is the Director.

Mr. DICKS. Let's hear from the person who made this projection.

Mr. BREZNAY. Projections are always difficult to make and this budget exercise is centered on the projection factor. We have been using the best available data that we can gather with respect to what is likely——

Mr. DICKS. Are you at OHA?

Mr. BREZNAY. That is right.

Mr. DICKS. But it says here in this year's budget justification so you can have the full flavor, "October 1, 1981, OHA had approximately 480 compliance and related cases. Using ERA projections, OHA expects to receive 4,420 new filings in fiscal year 1982."

Now, you are not with ERA, right?

Mr. BREZNAY. That is right. We are a separate office.

Mr. DICKS. Then, who gave you the projections, the information that you relied on or is this just faulty?

Mr. BREZNAY. Well, our data, when this material was put together, showed potential for 965 PRO's during fiscal year 1982. The 4,000 figure is based on that figure.

Let me explain how that is derived. In addition to the enforcement orders which would be litigated before us, assuming that firms do defend them and at the end of the program I would anticipate that they would, we have remands from Federal Court and from FERC which sit over us in terms of our adjudications and, based on our experience, we anticipate there will be 45 of those in the fiscal year 1982.

In addition, we are working actively on the settlement area involving distribution of refunds and looking at claims and we anticipate we will have 96 cases of that type filed in fiscal year 1982.

In connection with each one of those enforcement-related cases, experience tells us that there will be approximately three formal motions that will require analysis.

Mr. Dicks. Separate filings?

Mr. Breznay. Exactly. Motions for discovery, evidentiary hearing.

Mr. Dicks. So there can be a number of filings with a particular case?

Mr. Breznay. That is correct.

So our multiplier happens to be three so when you add up the enforcement cases, court remands, settlement cases, the number is 1,156 and then you add a multiplier of an additional three cases, then you come up with the 4,000-some-odd proceedings that will be initiated before OHA in 1982.

Mr. Dicks. Well, like the Federal deficit, are you adjusting your figures now? Has something changed? Do you still think that is a good number?

Mr. Breznay. It does not look like we are going to get the full number of enforcement cases.

Mr. Dicks. Why is that?

Mr. Breznay. I think they will tend to be loaded towards the end of the year.

Mr. Dicks. It is not because we are so slow in proceeding on the cases?

Mr. Breznay. It is a wonderful question and I have been curious about it myself but I can't go down to ERA and look at the way the work is going. I am precluded by ex parte rules from having that kind of contact because we are an independent office.

Mr. Dicks. That is a question for ERA.

Mr. Hanzlik. Yes.

Mr. Dicks. It reminds me of North Carolina—the four corners. It is called the stall or the delay game.

Mr. Hanzlik. Well, the number that Mr. Breznay has is 965, and is probably the number of pending cases on inventory that had not yet gone into formal enforcement actions.

Now, he was given our potential number of cases because we cannot assume any will settle for his purposes. We have to give OHA our maximum estimate.

Mr. Dicks. Right.

Mr. Hanzlik. Now, that number now is down to around 820 cases. We can't project settlement but always have to assume there is going to be litigation.

I wanted to add that we are not putting cases in OHA right now because once they go there it makes more difficult settlement negotiations.

We want to give the companies a chance at settling before they are faced with litigation.

Mr. Dicks. Is this called Volunteerism?

Mr. Hanzlik. Yes, Volunteerism. It is also called a small stick.

| | Summary | Refunds | Price Reductions | Escrow, Claims & Subpart V | Strategic Petroleum Reserve | Investments | Reduction Bank Component |
|---|---|---|---|---|---|---|---|
| GETTY | $25 million Cash<br>$50 million Bank Reduction | | | $25 million Escrow account to defray heating oil costs of disadvantaged persons | | | $50 million from gasoline and propane |
| AMOCO | $100 million Cash<br>$180 million Bank Reduction<br>$410 million Investment<br>Note: $250,000 Compromise penalty | $29 million Middle distillate customers in certain classes of purchasers | | $71 million (Subpart V) | | $410 million Exploration & enhanced recovery hydrotreating | $170 million from gasoline<br>$10 million from propane |
| SUN | $30,142,995 million Cash<br>$80 million Bank Reduction | $25 million U.S. U.S. Treasury<br>$4.7 million U.S. Treasury for litigation concerning fee free licenses<br>$442,995. Crude oil purchasers | | | | | $80 million from gasoline |
| | | $59,142,995 | | $96 million | | $410 million | $310 million |

| | Summary | Refunds | Price Reductions | Escrow, Claims & Subpart V | Strategic Petroleum Reserve | Investments | Reduction Bank Component |
|---|---|---|---|---|---|---|---|
| CORCO | $10 million Cash<br>$142 million Bank **Reduction** | $3 million Utilities<br>$7 million State & Local Govt. | | | | | Gas to $50 million<br>Propane to $3 mill.<br>($142 million) |
| KOCH | $14 million Cash | $4 million Utilities<br>$4 million State & Local Govt. and Transportation Customers | | $6 million 6 months Claims Fund | | | |
| PENNZOIL | $10 million Cash | $3.5 million Utilities<br>$3.5 million Defense Fuel Supply Center | | $3 million (Subpart V) | | | |
| TENNECO | $14 million Cash | $8 million Home Heating Customers<br>$2 million Utility & Airline Customers | | $4 million (Subpart V) | | | |
| TOSCO | $4 million Cash | $4 million Utilities | | | | | |
| | | $39 million | | $13 million | | | $142 million |

| | Summary | Refunds | Price Reductions | Escrow, Claims & Subpart V | Strategic Petroleum Reserve | Investments | Reduction Bank Component |
|---|---|---|---|---|---|---|---|
| CHEVRON | $82.5 million Cash | $25 million States and Territories<br>$14 million U.S. Treasury for litigation of supplemental oil import fees<br>$10.5 million Time Oil in settlement of PRO | | | $33 million worth of crude oil delivered to SPR | | |
| FARMLAND | $1 million Cash | $500,000 Member gasoline Customers<br>$500,000 Member propane Customers | | | | | |
| FINA | $14,000,000 Cash<br>Note: $10,000 Compromise Penalty | $14,000,000 Gasoline Resellers | | | | | |
| | | $64.5 million | | | $33 million | | |
| | | $266,142,995 million | $66 million | $146 million | $33 million | $910 million | $1,786 million |

APPENDIX B

OFFICE OF SPECIAL COUNSEL

Chart A

Program Status Summary As of February 28, 1982

| Company | % of Audit Work Completed for Audit Period through 01/28/81 | # of Compliance Actions | 12/4/77-11/30/81 $ Total of Compliance Actions |
|---|---|---|---|
| AMOCO | 100 | 4 | $ 122,458,157* |
| ARCO | 100 | 24 | 830,265,058 |
| ASHLAND | 100 | 2 | 58,415,859* |
| CHAMPLIN | 100 | 5 | 40,139,647 |
| CHARTER | 100 | 0 | 0* |
| CHEVRON | 100 | 17 | 417,163,167* |
| CITIES SERVICE | 100 | 3 | 77,041,212* |
| CLARK | 100 | 2 | 297,582,500 |
| COASTAL | 100 | 2 | 9,000,000* |
| CONOCO | 100 | 26 | 370,867,540 |
| CORCO | 100 | 0 | 0* |
| CROWN | 100 | 3 | 178,405,898 |
| ENERGY COOP | 100 | 0 | 0 |
| EXXON | 100 | 24 | 1,349,361,174 |
| FARMLAND | 100 | 0 | 0* |
| FINA | 100 | 9 | 261,800,291 |
| GETTY/SKELLY | 100 | 7 | 136,643,804 |
| GULF | 100 | 21 | 1,130,188,588 |
| HESS | 100 | 15 | 866,679,001* |
| KERR-MCGEE | 100 | 2 | 7,210,626* |
| KOCH | 100 | 6 | 0* |
| MARATHON | 100 | 15 | 369,090,067 |
| MOBIL | 100 | 20 | 837,917,610 |
| MURPHY | 100 | 7 | 112,811,204 |
| PENNZOIL | 100 | 0 | 0* |
| PHILLIPS | 100 | 5 | 108,179,705* |
| SHELL | 100 | 16 | 866,387,549* |
| SOHIO | 100 | 11 | 371,420,132 |
| SUN | 100 | 10 | 601,700,098* |
| TENNECO | 100 | 7 | 34,227,873* |
| TESORO | 100 | 1 | 963,915 |
| TEXACO | 100 | 24 | 1,332,923,835 |
| TEXAS CITY | 100 | 6 | 121,770,351 |
| TOSCO | 100 | 0 | 0* |
| UNION | 100 | 7 | 23,587,108 |
|  |  | 301 | $ 10,934,201,969 |

*Figure does not include global settlements.

## PROGRESS OF COMPLIANCE CASES

Mr. DICKS. Is there an indication that the program is moving much more slowly than you anticipated and that a significant unbudgeted workload will carry over into fiscal year 1983?

Mr. HANZLIK. No, sir.

I think we are moving in advance of our projections right now. We are, at a minimum, proceeding as we expected. We anticipate that we will have around 200 to 300 companies that will be in litigation at the end of this year in addition to what we have there now, with the rest of them settled.

Mr. DICKS. Let me go back to one point. You said that this Administration's figure for the alleged overcharges was $8.8 billion. It seems to me that what this committee is concerned about is making sure that you have the ability, the resources and the commitment to collect as much of that money as possible. We see that in 1981, you have allowed 10 percent of your budget to lapse. The money wasn't used.

Now, I don't complain about that except to wonder whether we are vigorously pursuing these series of cases in a timely way. Congress has provided resources to try to collect this money that has been overcharged from consumers, that lapse could indicate that you are not vigorously pursuing this activity?

Mr. HANZLIK. I can understand that possible conclusion. The money you are talking about was lapsed from 1981 funds, the last fiscal year. I think in the compliance program, $7.2 million lapsed.

This occurred before I was sworn in, but I am told that this was due to using only 1,115 as opposed to 1,305 full-time equivalents. It was a work force difference.

In answering your question, Mr. Chairman, I think the important point is that the program is now in a significantly different phase in which large numbers of people are not necessarily the key to our success.

We are preparing for intensive litigation and legal activity right now. We have left the audit-intensive phase of the program in which large numbers of people are needed and we are more than comfortable now with our staffing and funding levels.

## REFUNDS TO CUSTOMERS

Mr. DICKS. How much in overcharges have been returned to the consumers of this country at this point?

Mr. HANZLIK. There have been a total of $1.1 billion hard dollars collected. Of this amount, $586.3 million have been direct customer refunds.

Mr. DICKS. Does that go to wholesalers? Who does it go to?

Mr. HANZLIK. Mr. Lorenz, who is the official who negotiates these settlements, can explain how that money is dispensed.

Mr. LORENZ. Much of that could have gone to wholesalers. Much of it could also go to end users which would be actual end user customers and companies, or it could be State governments and utilities.

In addition, in the past, we have agreed to one remedy which is called a rollback. During the period of controls there was some reference point to allow the company to reduce its prices by 2 cents at the pump, which would pass on some savings to the consumer. That amounted to a refund to consumers where you have unidentifiable large numbers of people driving up to the filling station.

Mr. HANZLIK. When the Government can identify specifically the overcharged customers, the money goes back to them. It is not always possible to do that, and this explains why all the money has not gone to customers.

Another half of that money is now in Treasury escrow accounts for distribution at some later point.

## STATUS OF MAJOR REFINER CASES

Mr. DICKS. Last year, the Department informed the subcommittee that there were no settlements with the following 20 major refiners, Arco, Chevron, Conoco, Exxon, Gulf, Marathon, Mobil, Shell, Sohio, Texaco, Champlin, Cart, Crown, Energy Co-op, Farmland, Fina, Murphy, Tesserol, Texas City and Union.

At this time do you have settlements with all these refiners or any of them?

Mr. HANZLIK. Of the 35, we have settlements with 18 and we can give you those names. We have an additional three settlements that have been negotiated but which have not been announced publicly. We have 14, which are some of those you have named, that are in settlement discussions.

You can delete from your list Chevron, Farmland and Fina. Those three have been settled and have been announced.

Ashland is a fourth one.

Chevron, Farmland, Fina and Ashland have been settled in the last few months.

Mr. DICKS. That is fine. You may submit complete information for the record.

[The information follows:]

### MAJOR REFINER SETTLEMENTS

Settlements have been reached with the following major refiners: Amoc, Ashland, Charter, Chevron, Cities Service, Coastal, Corco, Farmland, Fina, Getty/Skelly, Hess, Kerr McGee, Koch, Pennzoil, Phillips, Sun, Tenneco and TOSCO.

## PURSUIT OF COMPLIANCE CASES

Mr. DICKS. Last year in the record the Agency stated: "Secretary Edwards has repeatedly expressed the Department of Energy policy of not granting amnesty for violations to the extent that cases cannot be completed during 1983, a likely occurrence under any level of effort, the Department will request the additional funding for fiscal year 1983."

Mr. HANZLIK. We are here today to ask for money for 1983.

Mr. DICKS. For the ongoing enforcement for these violations?

Mr. HANZLIK. Yes, sir.

Mr. DICKS. That is because we can't get them all done in fiscal year 1982.

Mr. HANZLIK. Whatever cases we don't resolve this year will be continued and completed next year.

Mr. DICKS. On page 19 in the budget justification you indicate the compliance program is intended to fulfill the Administration's commitment to enforce every meritorious case to obtain redress for overcharges.

What is your definition of a meritorious case?

Mr. **Hanzlik**. I will let the Special Counsel answer that because he is the one who makes those determinations.

Mr. **Lorenz**. I make those determinations in concert with the Solicitor's Office in the ERA, as well as the staff of the Office of General Counsel. Meritorious cases would be the cases in which we believe we have a reasonable chance of prevailing. There were cases that might ordinarily have been dropped in past years. This is a normal practice in a situation where we have determined a violation by a relatively large company but it was of de minimis character.

Mr. **Dicks**. How many have you dropped?

Mr. **Lorenz**. We have actually dropped fewer cases since October. Our rate of dropping cases now is much lower than it was. So far this fiscal year——

Mr. **Dicks**. How many have you dropped?

Mr. **Lorenz**. I am looking for the figure right now.

Mr. **Hanzlik**. In fiscal year 1981, Mr. Chairman, a total of 496 cases were terminated.

Now, these are cases in which no violation is found, or in which the dollar amount is so small that it was not cost effective to pursue them. There are some very small cases, involving only hundreds of dollars, and for reasons that Mr. Lorenz mentioned they are dropped.

Mr. **Dicks**. Were there any cases of significant size dropped?

Mr. **Hanzlik**. No, sir.

Mr. **Lorenz**. If there were any of significant size it was determined, on the basis of some court decision or litigation results, that it was not any longer an enforceable case. These determinations have to be made in any sort of legal program.

### SPECIAL INVESTIGATIONS

Mr. **Dicks**. The workload table on page 92 of the budget justification has a category labeled "Special Investigations". What circumstance leads to a special investigation?

Mr. **Hanzlik**. Special investigations is probably the most important activity of the program. This is the office which investigates transactions that may be willful in nature. When such information is uncovered and compiled, it is then referred to the Justice Department for criminal proceedings.

This is the office that begins the investigation of possible criminal violations and it is exclusively interested in that activity.

As I say, we are foremost interested in identifying and prosecuting people who willfully violated the regulations of this program, and there have been a number of indictments. There have been a number of convictions which this office initiated. I should add that the actual prosecution work is done by the Justice Department.

Mr. **Dicks**. Could you give us that number for the record?

Mr. **Hanzlik**. Yes, sir.

[The information follows:]

### NUMBER OF SPECIAL INVESTIGATIONS

The total number of open special investigation cases is 105, which involve 156 firms. A total of 69 cases are still in the investigative stage at DOE. A total of 36 investigations that have already been referred to the Department of Justice are still pending at the present time.

### COMPLIANCE WORKLOAD

Mr. DICKS. The major workload item for fiscal 1983 is the category DOE and FERC Appeals. Please explain to the committee what these appeals are.

Mr. HANZLIK. These are the cases in which we complete our enforcement work and file with the OHA for litigation.

Am I correct with that?

Mr. LORENZ. Yes.

Mr. DICKS. In last year's testimony I indicated that ERA was looking at streamlining the process and perhaps eliminating the FERC review. Were you able to streamline the process?

Mr. HANZLIK. No, sir; it was not done.

Mr. DICKS. Why?

Mr. HANZLIK. I don't have an answer because that proposal was before I was on board, and we have not had any discussions of that since then. I think our feeling is that it is not a problem right now.

Do you have anything to add to that?

Mr. LORENZ. No.

Mr. DICKS. The settlements and verifications workload item is interesting in fiscal year 1983 because you have staff assigned but no workload units.

What activity will be performed by the 18 people assigned to settlements and verification performance in fiscal year 1983?

Mr. LORENZ. The settlement and verification staff would be involved in two areas. One, once there is a consent order entered into there has to be verification or monitoring of compliance with the Consent Order.

Some of the Consent Orders provide for compliance into the future insofar as when the company is supposed to pay certain monies or perform certain acts. That includes deliveries to the Strategic Petroleum Reserve on different dates. Some companies, because of their financial condition, work out terms with us that would allow them to pay over the course of the year in installment payments.

In addition, we could expect some settlement activity to take place even while we are litigating, as any lawyer that has a docket of cases will be settling some of those cases while the case is ongoing.

### AUDITORS AS WITNESSES

Mr. DICKS. As audit personnel leave, what do you do to ensure that you will have proper support witnesses as cases go to litigation?

Mr. HANZLIK. There are two provisions. When auditors leave we ensure that the files they were working on are complete, fully documented and readily understood by another fully qualified auditor.

Secondly, we keep track of where the former auditors are. In this budget, we have requested funds in the event that we do need an auditor who has left our program to testify in a court hearing as a witness.

We are well protecting ourselves for that possibility.

Mr. DICKS. How much of the request is for that?

Mr. HANZLIK. It is $300,000.

Mr. DICKS. Last year you indicated that auditors are to be available to serve as witnesses for 2 years after their departure. Is this still the policy? Is 2 years adequate?

Mr. HANZLIK. I have never known that as a policy. We are not setting a time limit. We keep track of an auditor as long as the particular case he or she worked on is in litigation.

Mr. DICKS. Have you been able to keep proper witnesses available? Has there been a problem?

Mr. HANZLIK. I have not heard a problem on that at all.

## NATIONAL OIL JOBBERS COUNCIL PROGRAM

Mr. DICKS. Last March, a settlement for a recovery program for alleged civil violations of Federal pricing and allocation regulations by oil jobbers and retailers was implemented.

How successful was this program?

Mr. HANZLIK. That was the National Oil Jobbers Council program. There were a number of companies that participated. I will give you the exact number for the record later but I believe it was roughly a third of the companies participated in it. From that standpoint it was successful.

Mr. DICKS. Tell me what a settlement program is.

Mr. HANZLIK. Mr. Chairman, this involved a category of companies which are fuel distributors and classic jobbers. Their organization and the Department of Energy worked out jointly a program where any one of the companies settle their violations on a fixed schedule. They had to take it or leave it.

It was, I think, 38 cents on each violation dollar, which was a reasonable assessment. So, if you were a jobber, you had the opportunity of paying 38 cents on the dollar for the violations you had.

Now, the companies that did not participate felt that this amount was too high from their perspective.

Mr. DICKS. What are you going to do about the companies that did not participate?

Mr. HANZLIK. They are treated like every other case. We are pursuing them through separate settlement negotiations or in the alternative, they are going to be litigated like every other case.

Mr. DICKS. For the record, provide the specific results.

Mr. HANZLIK. Yes, sir; I will.

[The information follows:]

### RESULTS OF NATIONAL OIL JOBBERS COUNCIL PROGRAM

The National Oil Jobbers Council Program (NOJC) was successful in resolving a large number of product resellers cases. Approximately 355 firms were invited to participate in settlement negotiations pursuant to the NOJC agreement. Of this number, 256 open cases were made the subject to settlement negotiations with DOE, and 133 Consent Orders have been signed pursuant to the NOJC Program.

Mr. Dicks. Have you initiated similar settlement programs for other groups?

Mr. Hanzlik. No, we have not and don't plan to.

Mr. Dicks. Why?

Mr. Hanzlik. The problem is that every case is different and there just is no equitable formula you can work out for our remaining caseload that would do justice to the program.

### CONSENT ORDERS

Mr. Dicks. Information available to the committee indicated that in relation to total alleged violations brought in enforcement actions, Consent Order remedies vary widely.

Please explain these wide variations.

Mr. Hanzlik. I will let Mr. Lorenz explain.

Mr. Lorenz. In past years, the remedy of something like a rollback in prices was effective. We had a reference point upon which we could check the company. It might be 2 cents below their selling price as of some date certain. That was easy to consider. It is a realistic remedy.

Since decontrol, that kind of remedy is no longer an effective remedy. We are in an uncontrolled marketplace and it would be very difficult to refer to some maximum legal sale price or documented price.

Also, in the past we have had some part of the remedy considered to be a reduction in the company's reported or claimed bank which, during the period of controls, amounted to an effective risk for the company.

They were taking a chance that the bank reduction would limit their ability to raise prices at some future time. That no longer is an effective remedy and we are not considering those remedies these days.

We have also agreed to settlements where we attribute some of the violation or some portion of the settlement to crude oil production because of the generalized harm, the impossibility of determining exactly who was affected by an excessive price for crude oil that was sold to a refiner.

We considered, in those cases, a direct refund to the Treasury or a deposit into the Strategic Petroleum Reserve, of some number of barrels of oil to be a remedy for the generalized harm that was perceived.

Mr. Dicks. The Consent Order with the Standard Oil Company of California, Chevron, among other things, called for Chevron to deliver, as you have just mentioned, one million barrels of oil to the Strategic Petroleum Reserve.

Has this been accomplished?

Mr. Lorenz. I don't believe yet. There was a time limit set in the Consent Order.

Mr. Dicks. Wasn't the time limit December 31st?

Mr. Hanzlik. I believe the oil has been delivered. I have seen something to the effect that the amount of oil they delivered was somewhat short of the amount estimated; and Chevron is now going to refund the difference between the value of the oil delivered and $33 million.

The settlement called for $33 million worth of oil, and Chevron delivered $32.3 million or something like that.

The difference will be collected in hard dollars. But that oil, I believe, is in the reserve.

Mr. DICKS. How do you monitor Consent Orders in general?

Mr. LORENZ. That depends on the type of remedy that has been agreed to. If a company has agreed to make a refund to the Treasury, then the simple receipt of a check is sufficient compliance in that case.

If the company, on the other hand, has agreed to receive and make recommendations to the Agency for making refunds to certain of its customers, that is a much more lengthy process.

Ordinarily in that case the company would make a proposal to us as to who should be paid and how much and for what reasons and we would send some of our audit staff out to verify the company's representations.

The monitoring process, certainly for the major firms, is a case-by-case matter.

Mr. HANZLIK. We have a staff, Mr. Chairman, that does monitor each of these cases and ensures that payments are made on time.

Mr. DICKS. Are the resources requested enough to monitor settlement orders in fiscal year 1983?

Mr. HANZLIK. Yes, sir.

### ERA FIELD OFFICE

Mr. DICKS. ERA has an extensive field structure. The new organization now calls for eight field offices. Are these new?

Mr. HANZLIK. No.

Mr. DICKS. Have you reorganized?

Mr. HANZLIK. Yes.

Mr. DICKS. Tell us a little bit about that.

Mr. HANZLIK. When I came in last October there were 44 field offices. Many of these were set up as small offices to audit specific companies. It was easier for the Department to go to the headquarters of the company and place its auditors there than to work out of central offices.

We found that most of these small offices had completed their work but yet were still in existence. So what we did was to pick our eight major centers of activity and made them our main field offices and closed the small offices that had completed their work. We are now putting all of our field resources into these eight major offices, where the cases now are being handled.

I should add, the Agency program is essentially a field program.

### TRANSFER OF COMPLIANCE PROGRAM TO THE JUSTICE DEPARTMENT

Mr. DICKS. Yes, I can understand that.

The Administration's proposal of restructuring energy functions places the compliance program in the Justice Department as we discussed previously.

What ongoing discussions have you had with the Justice Department as to who would operate this program in fiscal year 1983 and how it would be run?

Mr. **Hanzlik.** I have had two preliminary meetings with the Assistant Attorney General, Civil Division, who heads the office within Justice that apparently would be the jurisdictional office for this program.

The discussions have been preliminary, to brief Justice officials about our program. The discussions that we have had both within the Department as well as the two that I have had with Justice are around the concept that we will maintain this program as it is, with its people and its expertise, and this will not involve integration into any other program.

It would be a self-contained program much as it is today. It would be administered by the Civil Division just as DOE is doing now. We will have a "turnkey" enforcement program that would be an appendage onto the Civil Division.

Mr. **Dicks.** Does the Justice Department have authority to handle the cases?

Mr. **Hanzlik.** They would under the reorganization plan.

Mr. **Dicks.** How much support from either the Department of Energy or Department of Justice attorneys' does your request assume?

Mr. **Hanzlik.** It assumes the support of the Office of General Counsel in the Department of Energy, where there is a staff of attorneys and litigation support people who have historically supported this program.

That is not in our budget, but I believe they are proposing $2.3 million to pay for 35 people dedicated to this program.

Mr. **Dicks.** Would you verify that for the record?

[The information follows:]

### General Counsel Support of the Compliance Program

In the fiscal year 1983 Department of Justice budget request for Administrative Support for Petroleum Regulatory Activities, the Administration is requesting $2,348,000 for legal and administrative support for the Compliance Program functions currently residing in the Economic Regulatory Administration. Of this amount, resources equalling $1,400,000 for 35 staff years will be provided from what is now the Office of General Counsel in the Department of Energy.

Mr. **Dicks.** Over the last several years the Department has been successful in collecting from oil companies in settlement of price overcharge cases.

How much of this has been collected in cash?

Mr. **Hanzlik.** That is in the record.

### NEED FOR FUELS CONVERSION PROGRAM

Mr. **Dicks.** The Congress appropriated funds for fiscal year 1982 to continue the fuels conversion program so that utilities wanting prohibition orders may be exempted from the New Source Performance Standards of the Clean Air Act.

What conditions will have changed in fiscal year 1983 to eliminate the need for this program?

Mr. **Hanzlik.** The anticipation is that the Clean Air Act will be amended to remove that obstacle and, therefore, it would no longer require this administrative assistance.

Mr. **Dicks.** What happens if it does not pass?

Mr. HANZLIK. If it does not pass, the Administration will be making a request to the Congress to continue this program in some capacity.

Mr. DICKS. Will you have finished all of the requests for Prohibition Orders you will have received by the end of fiscal year 1982?

Mr. HANZLIK. I can refer you to Mr. Workman, who is the Director of the Fuels Program, to give you a status report.

Mr. WORKMAN. In the budget that you have before you, we indicate that we are working on some 53 outstanding prohibition order cases. That was an estimate of how many powerplants would be sponsored by utilities for continued processing under the Fuel Use Act or under its predecessor, ESECA, or would be certified as technically and economically feasible for conversion and we would be asked to continue the prohibition order process under the Fuel Use Act, as amended by the Omnibus Budget Reconciliation Act.

The simple answer is that we have 25 cases now as opposed to the 53 that we had assumed at the time the budget was presented.

So, we don't have as big a workload now as we had estimated that we would have at the time we put the budget together.

The 25 cases that we have in hand represent 12 stations. We plan to and feel that we can finish the Prohibition Order activity on all but four of the stations by the end of this fiscal year.

### STAFFING FOR FUELS CONVERSION PROGRAM

Mr. DICKS. The conference report directed the Department to maintain the staff of the Fuels Conversion Program at the December 1981 level.

The budget is silent as to the staff you have to continue this program. What staffing level have you maintained for this program?

Mr. WORKMAN. We have 55 people currently on board in the fuels conversion program and that number is more than sufficient to carry out the work that we have ongoing.

Mr. DICKS. Do you plan to keep this staff throughout fiscal year 1982?

Mr. HANZLIK. We have no plans to reduce it. We have lost, since the beginning of the fiscal year, a few people through attrition, and it would depend upon what losses we have. We are not expecting any, but we plan to keep it at a level sufficient to handle the work we have remaining without any kind of reduction in force.

Mr. DICKS. How are you going to finish the four cases in 1982?

Mr. HANZLIK. Of course, if the Clean Air Act is amended, the cases are dropped. Prohibition Orders become superfluous. In the alternative, if there is no amendment, we will consider requesting necessary budget support from the Congress to staff up for that workload.

Mr. DICKS. Why did you downgrade the fuel conversion program from an office to a division in your reorganization?

Mr. HANZLIK. It was not a matter of downgrading. It was part of the reorganization. We wanted to put all of the fuels related activities under one Director, the fuels conversion program being one of the major activities. It is just a question of terminology. It is now called a division but it is as active, and important an activity as before.

## ENVIRONMENTAL IMPACT STATEMENTS

Mr. **Dicks**. In the last few months you have issued the Environmental Impact Statement related to utilities and the burning of coal in the Northeast. How many Conversion Orders may be issued under this EIS?

Mr. **Workman**. Actually the Environmental Impact Statement looked at 41 stations that might be converted, or were candidates for conversion in the Northeast. There are some 85 individual powerplant units that are represented at those 41 stations. We have Prohibition Order cases ongoing for a few of those. We have surveyed, just recently, the owner-operators of the 85 powerplants in the Northeast that were included. We have an indication from the utility owner-operators that 56 of those 85 units are proceeding towards conversion. To date, only 18 of those 85 have come to us and have either elected to continue processing of a Fuel Use Act order or certified to us under the OBRA amendments to the Fuel Use Act.

Mr. **Dicks**. Are there other regions where an area-wide EIS may be useful?

Mr. **Workman**. Yes, sir. We are initiating one for the State of Florida where we have a request from the Public Service Commission. Some 14 stations in the State of Florida, 29 individual powerplants, are being considered by the Public Service Commission for conversion where the utilities are also interested in the feasibility of conversion. We would be looking at the environmental impacts of all of those.

Mr. **Dicks**. Do you have funds for that?

Mr. **Workman**. Yes, sir.

Mr. **Dicks**. Do you pay for any site-specific Environmental Impact Statements?

Mr. **Workman**. Our policy now is to have the electric utilities pay the costs of the Environmental Impact Statements. But we are the ones selecting the contractors. The contractors are working for us.

## EXEMPTIONS FROM FUEL USE ACT PROHIBITIONS

Mr. **Dicks**. Last year you adopted new rules which are described as making it easier for utilities and industrial firms to obtain exemptions to Power Plant and Industrial Fuel Use Act prohibitions against using oil and natural gas.

Could you briefly describe what the rule changes are?

Mr. **Workman**. Basically, what we did there was not to make it easier to get an exemption that an owner-operator of a facility would not otherwise be able to get. Rather, we made the process of getting those exemptions easier and less burdensome in that we have changed many of the avenues to exemptions through a certification process by the industrial owner or the utility——

Mr. **Dicks**. This is known as self-certification?

Mr. **Workman**. Yes, sir.

Mr. **Dicks**. Tell us how that works.

Mr. **Workman**. There are different kinds of exemptions, but basically, the owner of a powerplant or facility that seeks a certain kind of exemption will certify to the qualifications of that facility related to the requirements for the exemption as laid out in the statute and our regulations, and provide us with the supporting information behind that assertion or self-certification.

Our staff will then look at that information and validate it, as opposed to generating the information and making the finding ourselves. The case is the same in the final analysis. Self-certification requires less work on the part of our staff as well as the petitioner and the whole process is much more streamlined than what it was before.

Mr. DICKS. Is there follow up by your staff to check the accuracy of the self-certification?

Mr. WORKMAN. That is what I mean when I say we validate.

Mr. DICKS. All right. Since it is likely the statutory requirement will continue into fiscal year 1983, why are you not continuing the capability?

Mr. WORKMAN. You are talking about capability to process exemption petitions?

Mr. DICKS. Right.

Mr. WORKMAN. This goes to the heart of the Administration's view that the Fuel Use Act is, in that regard, no longer necessary. Owners of industrial facilities are building new units that are coal-fired and alternate fuel-fired, as opposed to oil and gas-fired, in numbers that weren't contemplated and we weren't seeing at the time the act was passed.

If you look at the 2 years subsequent to the enactment of the Fuel Use Act, 1977 and 1978, you will see that 50 percent of new boiler orders were for oil and gas units. In the last 3 years, 1979, 1980 and 1981, that percentage has go down to 25 percent for oil and gas units.

So, you are beginning to see the industry moving away from oil and gas as opposed to——

Mr. DICKS. Will that continue in light of the current energy situation?

Mr. WORKMAN. Yes, sir, we believe it will.

Mr. DICKS. Should it?

Mr. HANZLIK. Well, the industry has a fairly long-range view of its development. I think they view the current oil economic situation as a temporary one, at least in their eyes, and they are looking down 5-, 10-, 20-year periods of time. They see, I think, over the long haul, that coal will be a more economical fuel for them, and, therefore, are making these decisions.

Mr. DICKS. A lot of the people in my part of the world don't think you really need the Fuel Use Act any more. They say, listen, there is extra natural gas and we have an oil shortage. So, some of them come into us and say maybe we have made a mistake in forcing everybody to use coal. I would like to know what is the Administration's position is?

Mr. HANZLIK. We agree with that position. In fact, the act was substantially amended last year in which all it provides now, in essence, is a vehicle for a company that wants to burn coal, to use this prohibition order process to get an exemption from the Clean Air Act.

So, in effect it is a mechanism to deregulate from another Agency's regulations. Once the Clean Air Act is properly amended, there is no need for the requirement for this mechanism. Your conclusions are correct.

Mr. **Workman**. If you look at today's prices of fuels, on an equivalent basis, dollars per million BTU, you will see that oil delivered to utilities, for instance, is $4.90 a million BTU. Gas is running $3 a million BTU and coal is running $1.50 a million BTU.

So, the economic advantage of going to coal as opposed to oil and gas is there. It is twice as expensive to burn gas as coal, over three times as expensive to burn oil. Those are today's figures.

Mr. **Dicks**. All right. But you would argue that this is a marketplace decision, wouldn't you?

Mr. **Workman**. That is correct.

Mr. **Hanzlik**. Yes, sir.

Mr. **Dicks**. Would the Government not be subject to lawsuits if you do not continue the program into fiscal year 1983?

Mr. **Hanzlik**. Without any change in the legislation, there would be a statutory responsibility for the Department to continue it.

## UTILITY CONSERVATION PLANS

Mr. **Dicks**. Similarly you propose to terminate the review of utility conservation plans.

What is your legal authority for terminating this review?

Mr. **Workman**. We are not proposing to terminate the review of the utility conservation plans. We have a plan for processing these electric utility conservation plans during this fiscal year. The conservation plans are required to be into us by August 13 of this year, and we have a plan of action through the detailing of 20 people from outside ERA, or outside the fuels conversion program, to supplement our own resources——

Mr. **Dicks**. You are going to review them all by October 1st?

Mr. **Workman**. We feel we can do that.

Mr. **Dicks**. Why don't you describe in some specific detail what that plan is?

Mr. **Workman**. Sure.

Mr. **Dicks**. It sounds to me like it might be a rather brief review.

Mr. **Hanzlik**. Some of these plans will come in before August 13. That is the deadline.

Mr. **Dicks**. Some will be in before.

Mr. **Hanzlik**. That is correct.

Mr. **Dicks**. Amplify this area for the record.

Mr. **Workman**. By statute we have to process these within 120 days anyway, so the whole process is a brief one anyway you look at it.

[The information follows:]

### DOE Plan for Review of Electric Utility Conservation Plans

Plans are submitted to DOE by utilities by not later than August 13, 1982 (some will arrive earlier).

Federal Register notice accepting the plans for review (30-day public comment period begins August 20, 1982).

Review of plans and public comments completed September 24, 1982.

Federal Register notice of approval of plans published September 30, 1982.

The above plan will require dedication of 10 personnel from the Fuels Conversion Program and an additional detail of 20 personnel from outside the Program.

### ANNUAL REPORT ON IMPLEMENTATION OF CONSERVATION PLAN

Mr. **Workman**. It is a one-time thing, not a continuing activity.

Mr. **Dicks**. Should it be?

Mr. **Workman**. Not in my estimation.

Mr. **Dicks**. Why?

Mr. **Workman**. Because I think the marketplace is already causing electric utilities to adopt conservation measures.

Mr. **Dicks**. Wait a minute. Right here it says "Section B, a Report on Implementation of Section 808 Plan. Any electric utility required to submit a conservation plan under section 808 shall annually submit to the Secretary a report identifying the steps taken during the preceding year to implement such plan." How are you going to do this without any people?

Mr. **Hanzlik**. Your question is addressing the annual requirement?

Mr. **Dicks**. Sure.

Mr. **Hanzlik**. This is a short-term project when these plans come in. By statute you have to review them in 120 days. In future years, assuming the Fuel Use Act is not repealed and this requirement is not deleted, then the Department will staff for this from its own resources, on an annual basis, for a short period of time.

Mr. **Dicks**. Well, we have some additional questions we are going to ask for the record.

### HEARINGS AND APPEALS CASE BACKLOG

The budget assumes that you will have a backlog, under hearings and appeals, of 3,860 cases at the end of fiscal year 1982 and 2,309 at the end of fiscal year 1983. Do these backlogs develop because of a lack of staff, or do procedural delays create the backlog? In general what creates the procedural delays?

Mr. **Breznay**. Let me talk to the first part of the question first. If the case comes in at the end of a particular fiscal year, the regulations and time periods involved in even beginning to get to work on that case will take you well into the following fiscal year. For example, there is a 60-day period for the exchange of initial briefs. Then discovery, evidentiary hearings and other pretrial activities can take a case substantially into that fiscal year before you even get close to the merits.

So, it really depends on when a case is received during a particular fiscal year whether or not it is going to show up in inventory at the end of that year. Most of our enforcement cases take at least a year now to decide, and throwing additional resources at them in my judgment is not going to reduce that time period. I think we have adequate resources to cope with our workload now. It is just inherent in the system where two sides are taking strongly adversarial positions, that it will take a while to shake down a fair, equitable result. That is what we are doing.

### PURSUIT OF COMPLIANCE CASES

Mr. **Dicks**. Well, Mr. Hanzlik, I just want to ask you one final thing. As I mentioned earlier, this committee is concerned about this. When we are talking about this amount of money, $8.8 billion under your own estimates, we must do everything we can to vigorously enforce this program. I just would like some assurance from you that we are going to vigorously try to recover as much of this money, through this program, as possible.

Mr. **Hanzlik**. Mr. Chairman, my public statements on the subject, as well as the way this program is being managed, fairly substantiates that we mean business. Our record since October indicates that we are pursuing more cases, dropping fewer cases, and collecting more money on the dollar. We plan to have every one of these cases that are meritorious prosecuted in litigation if they are not settled. And I will pledge to you and this committee that we will do this to our utmost.

Mr. **Dicks**. The other thing we want to make sure of is that the money as much as is possible is returned to the consumers who were initially overcharged.

Mr. **Hanzlik**. I agree with that.

Mr. **Dicks**. I would hope the Department of Energy would make every possible effort toward achieving that goal, particularly during these very difficult economic times. I know it has been some time since these violations occurred, but I would hope that this money would be returned to the person who was overcharged whenever possible.

My colleague, Congressman Moffett on the House Environment and Energy Subcommittee, is also very concerned about this program.

I just want you to know that we are going to watch this program very carefully. We provided additional money to make sure that you have had the resources necessary to vigorously pursue it. We don't believe in throwing money at problems either. If the Department is going to let part of its resources lapse as happened in 1981, this committee should be informed.

Mr. **Hanzlik**. We will be spending I think virtually all of our fiscal year 1982 money.

Mr. **Dicks**. What is your 1982 budget?

Mr. **Hanzlik**. Our budget is $33.6 million this fiscal year.

Mr. **Dicks**. It's $36 million this year. You are reducing it to $13.5 million, a reduction of $23 million. Now, you have said you won't need the auditors. Those auditors must be awfully expensive.

Mr. **Hanzlik**. They are. They are two-thirds of the Agency.

Mr. **Dicks**. Two-thirds of the budget?

Mr. **Hanzlik**. Yes.

Mr. **Dicks**. So, they are all gone now?

Mr. **Hanzlik**. At least a good portion of them will be by fiscal year 1983.

### USE OF CONTRACTORS

Mr. **Dicks**. Was it more expensive to contract out the work than it would have been to do it in-house?

Mr. **Lorenz**. On a per hour basis, probably so.

Mr. **Dicks**. There is this myth that we do so much better by contracting out. Based on my experience, in many instances it is more expensive to turn to the private sector than to do the work inhouse. I just hope that during your administration of this responsibility that you will not get lured into the idea that contracting is always the answer. One of the things that happens is, once you lose those people and the ceilings it is hard to get them back.

Just based on experiences we have had in other areas, it doesn't turn out to be a good investment for the Government over the long period. After the decision to contract out has been made, the price goes up.

Mr. HANZLIK. Right.

Mr. DICKS. You have heard of the Defense Department. I am on that subcommittee. I can give you a lot of examples of how the price goes up once they know that they have the work and responsibility.

Mr. HANZLIK. That is right.

Mr. DICKS. They'll say, "We had to change this, and it is going to cost more than we thought."

Mr. HANZLIK. We are not using any additional outside contractors.

Mr. DICKS. Are you using any outside legal counsel?

Mr. HANZLIK. We have contracted for legal management services which provide files, dockets and some paralegal services. But our lawyers are Agency lawyers. We are a self-contained team.

### CONFLICT OF INTEREST

Mr. DICKS. Do you have any prior clients involved in this?

Mr. HANZLIK. Do I personally? No, I don't.

Mr. DICKS. Yes, that were involved in any of this?

Mr. HANZLIK. No.

Mr. DICKS. The only reason I raise that is because your résumé indicates you were in some very impressive law firms.

Mr. HANZLIK. No. My hearings looked at that very carefully.

Mr. DICKS. I am sure they did. All I am saying is in certain instances you may have to withdraw yourself. I do not know if it has been a problem or not.

Mr. HANZLIK. It has not been a problem.

Mr. DICKS. All right. I appreciate your testimony. We have some additional questions to be answered for the record.

Mr. HANZLIK. All right.

Mr. DICKS. Thank you. We will stand in recess until 1:30 this afternoon.

[The questions and answers follow:]

## ADDITIONAL COMMITTEE QUESTIONS

### Economic Regulatory Administration Reorganization

Question: Since our hearing with you last year, the Economic Regulatory Administration (ERA) has experienced a major reorganization. Could you briefly describe what functions are now in the Economic Regulatory Administration, how they are organized and tell us what functions are no longer part of ERA and where they are now located?

Answer: Since our last hearing in April 1981, the Economic Regulatory Administration has experienced two reorganizations. The first reorganization, effective in May 1981, transferred to the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness the emergency preparedness functions of the ERA. These functions included the economic and data analysis activities required by Executive Order 12044, the petroleum market price and supply analysis activities required under the National Evironmental Policy Act, the power supply and reliability activities, the energy contingency planning activities, and the activities of the Energy Liaison Center.

The second reorganization, effective in December 1981, did not transfer any functions out of ERA. This reorganization merged the Offices of Enforcement and Special Counsel, established a centralized support office, and consolidated the non-enforcement activities, fuels conversion and petroleum operations, into one program office.

Question: When you informed the Committee of the reorganization you stated that the 1977 Sporkin Task Force recommendations were considered in arriving at the new organization structure. How are the Sporkin Task Force recommendations reflected in the new organization?

Answer: The December 1981 reorganization of the ERA enforcement program is totally consistent with the major recommendations of the Sporkin Task Force Report concerning the integration of legal skills into the compliance program. Although the Office of the Solicitor is now separate and distinct from the Office of Special Counsel, the field organization, which has unprecedented authority to audit, investigate and initiate enforcement actions, reflects total integration of all enforcement skills, including legal skills. Delegations of authority from the Special Counsel and the Solicitor have been provided to each of the eight field offices. In each of the offices except one, an experienced lawyer has been placed in charge of all operations of that office. This replaces the dual supervision of a chief auditor and chief lawyer that existed prior to the reorganization. Streamlined review procedures are being established to provide the field offices with as much independent authority as possible. We feel that these changes, incorporating the spirit of the Sporkin Report, will contribute to the effectiveness and efficiency of the program.

## Compliance

Question: When you say an audit is completed, does that include the auditor having written up a report?

Answer: Normally, following completion of an audit, a report is written containing audit findings.

Question: What is the current status of the non-major refiner audits?

Answer: The majority of non-major refiner audits are completed. Approximately 160 audits remain to be completed primarily in the crude reseller area. ERA expects to complete all remaining audits by September 30, 1982, to the extent that certain access disputes can be resolved in a timely manner.

Question: Of the dollar amount available for compliance in FY 1982, how much has gone and will go to the audit function? Please break it out between majors and others.

Answer: It is estimated that about $15 million will be spent on approximately 300 audit staff years during FY 1982. One-third of this will be for major refiners, and two-thirds for work involving all other firms.

Question: There was 100 percent audit coverage of major refiners. What percent of the non-majors is being audited? What was the basis for cutting if off at that level?

Answer: The percentage of audit coverage of firms other than major refiners varied widely between product groupings. Of approximately 450 known crude resellers, 256 have been selected for audit, representing at least 80% of the sales volumes of that particular market. Approximately 90% of small refiners were audited. With respect to crude producers (totalling almost 20,000), firms were selected for audit based upon their relative size and on the basis of high percentages of higher priced and exempt oil reported on forms submitted to DOE. Independent retailers were selected for audit in large part on the basis of customer compliants transmitted to ERA through its long distance "Hot Line".

Question: Of the original 35 major refiner cases you now estimate that only two or three will remain to be litigated by the beginning of FY 1983. What is the basis of that estimate?

Answer: Global settlements have not been reached with 13 major refiners. On the basis of past experience and present on-going negotiations, it is estimated that settlements will be reached with at least 10 of these companies during the remainder of the current fiscal year.

Question: How many major refiners have actually settled as of today? How many major refiners settlements are pending?

Answer: Global settlements have been reached with 18 major refiners to date. In addition, agreements in principle have been reached with three additional major refiners, with whom ERA is currently negotiating the text of actual consent orders. Notices of probable violation previously issued to one of the major refiners have been rescinded on the basis of a determination that no overcharges occurred. Settlements are presently being negotiated with 11 major refiners.

Question: Are there any now in litigation?

Answer: Of the 13 major refiners with which we have not reached global agreements, the Economic Regulatory Administration has actions in administrative or judicial litigation against 12.

Question: For the record provide a table which shows the settlement amounts and alleged violation amounts by program?

Answer: The following table shows settlement amounts versus alleged violations for those cases involving other than major refiners in which a Notice of Probable Violation (NOPV) was issued:

Other Than Major Refiner Program
Settlements vs. Alleged Violations

July 1, 1975 - September 30, 1981

| Type of Violation | Alleged Violation Amount | Settlement Amount |
|---|---|---|
| Crude Producers | $67,465,895 | $46,606,069 |
| Crude Resellers | 3,087,258 | 431,192 |
| Small Refiners | 42,682,446 | 32,013,661 |
| Entitlements | 10,739,947 | 4,707,551 |
| NGL Processors | 30,963,345 | 21,599,808 |
| Product Resellers | 54,925,366 | 17,887,399 |
| Product Retailers | 7,720,455 | 6,015,775 |
| Total | $217,584,712 | $129,261,455 |

It must be noted that this table does not reflect settlements reached without issuance of an NOPV. It is not possible to include these cases since alleged violation amounts are not specified until an NOPV is issued. Total settlements achieved in this program as of March 25, 1982, are $793,795,041.

## Field Structure

Question: What functions are being performed in these offices during FY 1982?

Answer: ERA's field offices are currently engaged in completing pending field audits and placing cases into litigable form. These offices also negotiate settlements with oil firms other than major refiners.

Question: What will the field structure look like in FY 1983? What role will the field offices have in FY 1983?

Answer: No decision has been made, as yet, regarding the structure of ERA's field offices during FY 1983. It is expected that a decision regarding the structure and role of field offices during FY 1983 will be made within the next several months.

Question: How much support from either Department of Energy or Department of Justice attorneys does your request assume?

Answer: The Economic Regulatory Administration's FY 1983 request assumes the same level of support from the Department of Justice (DOJ) that it currently receives. DOJ handles litigation of cases in which it has assumed primary jurisdiction in accordance with a working agreement between DOE and DOJ. With respect to criminal matters, DOJ is responsible for the handling of all aspects of investigation and prosecution following the referral of such cases by DOE.

The Department of Energy's Office of General Counsel will support ERA's compliance program with 35 staff years and $1.4 million in FY 1983. Twenty three of these staff years will be attorney staff years.

Question: Is this support over and above the compliance request of $13.5 million?

Answer: The expected FY 1983 support from the Department of Justice and the Department of Energy's Office of General Counsel is not included in ERA's Compliance program request of $13.5 million.

Question: What amount of time elapses between settlement and collection and then between collection and disbursement?

Answer: Following a negotiated settlement of an enforcement case, a consent order is executed between the Department and a company. Under certain circumstances, formal notice of such settlement is required to be published in the Federal Register providing for a minimum of 30 days public comment prior to its adoption in final form. Following final action on a consent order, the company must make payments within the time limit prescribed by the provisions of the consent order. In some instances consent orders provide for a staggered period of payments. Some consent orders further provide a period during which claims may be filed and payments made following the expiration of the claims period.

Question: What steps are you taking to expedite disbursement?

Answer: With respect to funds placed in government escrow accounts, ERA is currently engaged in a comprehensive effort to identify purchasers that may have been overcharged as a result of the violations found during the course of the audits. Following completion of this effort, disbursement to appropriate customers will be made on an expedited basis.

Question: Where in the organization are the disbursements managed?

Answer: With respect to government escrow accounts, actual disbursements are made by DOE's Controller based on Economic Regulatory Administration or Office of Hearings and Appeals decisions as to the identity of persons to whom payments should be made.

## Fuels Conversion

Question: How many additional requests for prohibition orders do you think may be reasonably expected to be received?

Answer: Under the provisions of the Omnibus Budget Reconciliation Act, a utility must elect continued processing of prohibition orders or certify as to conversion eligibility. Utilities did not elect continued processing of 28 units for which conversions were proceeding. Although these utilities have indicated interest in converting their powerplants to coal, they have not to date sought DOE assistance. There are 44 additional powerplants for which utilities have indicated some interest in DOE assistance in the conversion process. However, we cannot realistically estimate how many will seek DOE assistance.

Question: The budget at page 97 states that "a budget adjustment will be proposed if any essential work is not complete at the end of FY 1982". What sort of budget adjustment do you have in mind?

Answer: A budget adjustment would be proposed if there are resources necessary to accomplish any work required by statute. It is not possible at this time to predict what level of resources would be needed if a budget adjustment were required.

## Emergency Preparedness Responsibilities

Question: With the lifting of price controls on oil and the expiration of the Emergency Petroleum Allocation Act, the petroleum operations program is greatly diminished. Do you maintain any emergency preparedness responsibilities in this program? If so, could you tell us what they are and what resources you have devoted to it?

Answer: The Economic Regulatory Administration has no direct responsibilities for emergency preparedness. The responsibilities are now assigned to the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness.

## Oil Imports

Question: What base capability to collect oil import fees in the event such fees are reinstated do you maintain? What budgetary resources are devoted to it?

Answer: We have a computerized system which has the capability to monitor all imports by license and importer and to prepare itemized monthly invoices in the event fees are imposed. The invoices would be processed through DOE's financial services office, which would be responsible for collection of fees. The 14 full-time employees budgeted for oil import functions represent our base capability. They are currently devoted to processing license applications and other related activities.

Question: From FY 1981 to FY 1982 the number of oil import licensing actions completed doubles from 2,000 to 4,000. Yet the staff level remains the same. How do you double the workload with the same staff? Why would this workload item increase in the face of a decline in imports?

Answer: The 2,000 figure for FY 1981 is inaccurate because the number of applications has been at the 4,000 level for a number of years. The number of license applications is not a function of the volume of oil imported.

Natural Gas Imports

Question: You want to put 5 additional staff years into preparation of analyses of the natural gas industry and the effects of imports on domestic production. What is the purpose of these studies?

Answer: In the past year we have received applications to import large amounts of gas into New England and the Middle Atlantic States. These imports would represent a fundamental change in energy dependence for that area and require thorough evaluation. The analyses are becoming more complex as we approach decontrol and thus require the staff years requested.

Question: What are you trying to learn about the natural gas industry? How will this information be used?

Answer: Specifically, we will be studying the national and regional needs for imported gas to supplement domestic supplies, the effects of price change in world energy markets on U.S. gas imports, and the effects of domestic gas decontrol. The information will be used to support decisions on import and export authorizations and to recommend appropriate policy initiatives.

Question: How does the information you want to collect differ from EIA's Financial Reporting System?

Answer: EIA's Financial Reporting System does not provide this type of analysis. Our analyses are in direct support of decisions on licensing specific natural gas imports.

Question: On page 88 of the budget request one of the petroleum operations activities you identify for FY 1983 is participation in FERC regulatory proceedings. What is the nature of your participation in FERC regulatory proceedings?

Answer: We coordinate with FERC on cases filed jointly before ERA and FERC. Also, when FERC issues rulemakings or takes other actions which affect imports indirectly, we have participated by intervening in those proceedings to put the Secretary's position on the record so that it could be considered by FERC. Occasionally, the Secretary has proposed policies to FERC for its consideration in the form of rules as permitted by the DOE Act. Also, rules mandated by the Natural Gas Policy Act require coordination with FERC.

Question: Please quantify in terms of staff years how much effort goes into activities associated with FERC both for FY 1982 and FY 1983. The workload table on p. 95 indicates that this activity will not be carried out in FY 1983. Is the table accurate?

Answer: Three staff years were budgeted in FY 1982 for rulemaking proceedings, while none are budgeted for this activity in FY 1983. This reflects the diminished regulatory activity of the Administration as well as the completion of the rules required by the Natural Gas Policy Act.

Question: A new workload item for FY 1983 is evaluation of export country policy and contract terms. Why do you need to initiate this activity in FY 1983?

Answer: Contract terms are becoming increasingly complex. Canada has recently begun proceedings reviewing all of its export licenses and policies. We will need to examine any changes and evaluate their impact.

Question: Was this being carried out elsewhere in DOE previously?

Answer: International Affairs provides a policy perspective on the international gas market, but is not involved in specific case determination.

Question: The workload for import/export applications reviewed and processed increased from FY 1981 to FY 1983 from 52 to 59; yet, the staff decreases from 7 to 4. How have you improved efficiency to make this reduction possible?

Answer: While we are showing a declining staff for application processing, this is only because we are trying to more accurately reflect the work involved as evaluations and analyses. The staff commitment to gas import/export activities remains basically unchanged.

Question: For what reasons would you turn down an import or export application?

Answer: An import application would be turned down if it were found to be "inconsistent with the public interest." Factors considered include national and regional need for the gas, price, security of supply, and balance of trade.

## Petroleum Information

Question: The budget justification (p. 94) states that "it is in the national interest to maintain information on oil imports and domestic production as well as international supply." Could you describe what information you maintain and how you collect it? How does this information differ from the information EIA maintains?

Answer: We collect information on imported crude oil and refined petroleum products by type and producing country. We also collect information from first purchasers on the volume, by state, of domestic crude oil produced. The information is reported by the company which imports or purchases. ERA's data complements and does not duplicate the information collected by EIA.

## Natural Gas Imports

Question: At page 94 of the justification you state that "through the authorization of imports and exports of natural gas, domestic supplies will be supplemented at a price that will not dampen production." Does this mean that you would prohibit imports of natural gas if the volume and price would undercut domestic production? Might this not lead to higher prices for consumers?

Answer: Effects on short-term domestic production are one factor in determining need for the gas. However, we must also consider long-term supply deliverability. Decisions on specific applications are made according to the facts and record of a particular proceeding.

## Petroleum Operations Contracts

Question: There is a request of $300,000 for contract dollars to prepare environmental impact statements and economic analyses for the natural gas program and for the first purchaser monitoring program. What do these environmental impact statements and economic analyses cover?

Answer: These funds would be used for environmental studies for new import projects including liquefied natural gas.

Question: How many of each do you propose to do? How does the $300,000 FY 1983 request compare to the amount you will use in FY 1982?

Answer: The number of analyses will be dependent on the nature of import applications received. The budget request is based on an estimate of two environmental impact statements and associated economic analyses. $500,000 of contract support will be used for Petroleum Operations in FY 1982.

## Entitlements Program

Question: What is the status of the closeout of the Entitlements Program? Do you still think it will be closed out by the end of FY 1982? If not closed out by the end of FY 1982, will you still have the appropriate staff to complete the program?

Answer: Formal closeout of the Entitlements Program has been held up by litigation since March of 1981. The conclusion of the adjudicatory process is unpredictable with regard to timing and results. We are assuming a FY 1982 resolution and program closeout. The expertise necessary to close out the program in FY 1983, if FY 1982 closeout cannot be accomplished, should continue to repose in Petroleum Operations or elsewhere in the Department.

## Severance

Question: You are requesting that $2,300,000 be made available from previously appropriated funds to pay for costs associated with changes in personnel. What changes in personnel makes this request necessary?

Answer: This request is being made in order that the Department will be able to make FY 1983 severance payments to those Compliance field office personnel involuntarily separated during FY 1982 that are still eligible for payments after September 30, 1982, and in order to have funds available for potential reductions in force in Fuels Conversion and other programs funded by this appropriation that may be necessary to attain final FY 1983 staff year ceilings.

Question: What has your experience to date been with severance pay? For example, of the number of people leaving ERA, what portion have requested severance pay? On the average, how much severance have you had to pay per person?

Answer: Of the 1190 people who have left ERA between March 7, 1981, and March 6, 1982, 286 were involuntarily separated or resigned with severance eligibility. The Department has not experienced total costs involved with all personnel involved with FY 1981 and FY 1982 reductions in force, so that an actual severance cost rate has not been derived. However, it is estimated that the average severance-type payment will be $9,500, consisting of $4,500 in severance payment, $2,000 in accrued annual leave and $3,000 in reimbursed unemployment insurance.

Question: How much severance pay do you now estimate you will have to pay in FY 1982?

Answer: The current estimate of FY 1982 severance-type costs associated with this appropriation is $2.5 million.

## Office of Hearings and Appeals

Question: The Budget appears contradictory on whether you will receive any new compliance and related case matters in FY 1983. On page 101, you state that 35 percent of the 570 new petitions will be compliance and related case matters. Yet, on page 103, you state that no new compliance cases are projected after FY 1982. Which statement is correct?

Answer: Both statements are correct. According to estimates provided during the preparation of the FY 1983 budget request the Economic Regulatory Administration projected issuing 965 Proposed Remedial Orders (PRO's) during the 1982 fiscal year and none during FY 1983. OHA assumed that the bulk of these determinations would be received during FY 1982 but not resolved prior to FY 1983. Accordingly, most of the projected 965 PRO's are reflected in the OHA FY 1983 opening inventory of unresolved cases. OHA also assumed that a small number of PRO's would be issued so near the end of FY 1982 that no OHA submissions would be received until FY 1983. (No formal "submission" to OHA is made until the recipient of a PRO objects by filing defenses.) In addition, OHA assumes, based upon actual experience, that each PRO will also lead to three other related submissions such as Motions for Discovery, Applications for Stay or Requests for Evidentiary Hearings. In this regard, for PRO's issued during FY 1982, the related submissions might not be received until FY 1983. Therefore, while ERA states that it does not intend to issue any new PRO's after FY 1982, OHA projects that approximately 35 percent of the case receipts projected for FY 1983 will be compliance related.

Question: The budget assumes that you will have a backlog of 3,860 cases at the end of FY 1982 and 2,390 at the end of FY 1983. Do these backlogs develop because of a lack of staff or do procedural delays create the backlog? In general, who creates the procedural delays?

Answer: The inventory of unresolved cases projected for the end of FY 1982 and FY 1983, respectively, results because the 965 Proposed Remedial Orders (PRO's) which the Economic Regulatory Administration projects issuing during FY 1982 will be issued toward the end of the year. Since the procedural regulations specify that a period of at least 95 days must pass between the issuance of a PRO and the first point when OHA may begin to resolve the matter, few, if any of these PRO's and the related submissions could be disposed of during FY 1982. In addition, the firm to which the PRO is directed may, by filing various motions or by presenting good cause for an extension of time, extend a proceeding. Each of these motions or requests requires a formal response. In addition, a formal hearing may be requested and held in connection with these motions and further exchanges of submissions may follow each hearing. Furthermore, in most instances procedural submissions must be considered sequentially; consolidated consideration of these matters is rare. All of these procedural actions are also available to and frequently used by the ERA Office of Special Counsel in prosecuting PRO's. The use of these procedures, for whatever purpose, can substantially delay the resolution of a PRO proceeding. For example, at the end of the month of February 1982, the average PRO proceeding in the OHA inventory was 460 days old. On this basis we assume that a substantial number of the PRO's issued during the last part of FY 1982 will be open and unresolved -- irrespective of OHA staffing levels -- at the end of FY 1983.

Question: Do you feel that the firms whose cases are being delayed suffer any hardship from these delays?

Answer: As a result of the issuance of the January 28, 1981 Executive Order decontrolling crude oil and refined petroleum products, there are few ongoing regulatory requirements which would constrain or otherwise adversely affect a firm's current operations during the pendency of a proceeding before OHA. An exception is the requirement to file certain data or forms with the Energy Information Administration (EIA) of the Department. A firm seeking an exception to relieve it of such a filing requirement is required to continue to file with the EIA whatever information is necessary while its exception application is being considered. However, OHA has only 11 cases of this type on hand at this time. In connection with remedial proceedings, the party involved usually retains the use of any funds in question during the course of the proceeding so that a loss of the use of contested funds is not an issue. Where an escrow of contested funds is involved, the escrow account is interest bearing. Accordingly, OHA does not believe that any firm is being materially affected by any processing delays.

Question: Do you still maintain field offices? If so, for the record, provide the Committee with their location and the staff resources associated with each for both FY 1982 and FY 1983.

Answer: All of the OHA regional center office structure was dismantled effective with the end of the 1981 fiscal year.

Question: For the record, provide a breakdown of your non-compliance workload. Is your productivity experience in this area similar to that of compliance cases? If not, please provide information as to what your productivity experience is in these areas?

Answer: As of the middle of March 1982 OHA had on hand an inventory of 281 submissions which were not compliance related. These submissions include 117 Applications for Exception and 13 Freedom of Information Act Appeals, 18 Appeals, 15 Applications for Stay and Temporary Stay, 13 Petitions for Special Redress and 57 refund proceedings. This figure does not include 31 Subpart V proceedings in which a final Decision and Order has been issued and pursuant to which claims are currently being filed. OHA does not maintain productivity data on a case-by-case or on a type of case basis. We are accordingly unable to provide productivity data which contrast compliance and non-compliance matters. However, because the amounts of money involved in compliance proceedings are frequently large, affected firms contest these matters vigorously, raising complex legal and factual issues, so that the cases are difficult and time consuming. The fact that these cases often involve some of the most difficult regulatory questions reinforces the conclusion that compliance proceedings generally require a greater commitment of staff time and thus entail lower productivity.

Question: You expect to complete 90 percent of non-compliance filings due to priority processing requirements. What are the requirements that give these cases priority?

Answer: Non-compliance filings, such as Applications for Stay and Freedom of Information Act Appeals are subject to procedural and statutory processing limitations, respectively. The DOE Procedural Regulations require that an Application for Stay be granted or denied within 10 days when administratively feasible. Freedom of Information Act Appeals are required by the Freedom of Information Act, 5 U.S.C., Section 552, to be decided within 20 days.

Question: Does your FY 1982 experience to date confirm your predictions of FY 1982 workload? If not, please explain how it differs from the budget justification.

Answer: For the 1982 fiscal year, OHA projected receiving 4,750 submissions, of which 4,420 would be compliance related. These projections were based in part upon guidance from the ERA regarding the number of compliance actions to be taken during FY 1982 and OHA's historical experience as to the number of related cases which would derive from these projected compliance actions. As of the end of February 1982, actual OHA case receipts were running at approximately 12% of projections. The principal difference between projections and actual receipts lies in the ares of compliance and related filings. We understand, however, that ERA's projections of its FY 1982 compliance activity remain relatively unchanged, so that the projected case activity could occur during the later part of the 1982 fiscal year.

Question: There is a request for $325,000 for publication by Commerce Clearing House of precedential decisions and orders. How does this request compare with previous years? Do private users of the decisions and orders reimburse the government for this service?

Answer: Prior to FY 1983 the cost of publishing OHA Decisions and Orders by Commerce Clearing House has been covered under a two year contract maintained by the Economic Regulatory Administration. Excluding the costs associated with publishing Federal Energy Regulatory Commission materials, during the twelve month period ending April 30, 1982 publishing costs under the contract will approximate $412,500. OHA-associated publishing costs are estimated as 85-90 percent of this cost figure.

## QUESTION SUBMITTED BY CONGRESSMAN RALPH S. REGULA

### National Regulatory Research Institute Funding

**Question:** As you know, Congress intended that $1.2 million be made available from FY 1981 Economic Regulatory Administration funds for the National Regulatory Research Institute. Because the conference report was not signed into law until after the start of FY 1982 funding for the program had lapsed. When I asked the Secretary about a possible reprogramming to provide funding in FY 1982 he said potential sources were being reviewed within the Department to determine if funds are available for the final year of the grant and that the ERA had taken steps to extend the grant period of performance. What is the current status of funding for the NRRI? Have funds been found from within the Department to fulfill the second year grant commitment or will you seek a reprogramming? If this is still uncertain how soon will you be making a final determination?

**Answer:** Funds have not yet been provided to NRRI to continue the grant through this fiscal year. ERA is working with other components of DOE, including the Controller's Office, on the problem. We should have a determination in the near future.

THURSDAY, MARCH 18, 1982.

## ENERGY INFORMATION ADMINISTRATION

### WITNESS

J. ERICH EVERED, ADMINISTRATOR, ENERGY INFORMATION ADMINISTRATION

### OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order. This is the hearing on the Energy Information Administration's fiscal year 1983 budget.

Appearing in support of the budget is the Administrator for EIA, Mr. J. Erich Evered. Mr. Evered has a biography which may go into the record at this point. He also has a statement which may go into the record at this point. Let's hear, Mr. Evered, what you want to tell us about the budget for the year.

[The statement and biography of J. Erich Evered follows:]

### BIOGRAPHY OF J. ERICH EVERED

J. Erich Evered was nominated by the President on June 3, 1981, and confirmed by the Senate on June 19, 1981, as Administrator of the Energy Information Administration, U.S. Department of Energy (DOE). In this position, Mr. Evered is responsible for the Department's statistical information system which includes management of energy data collection, processing and analysis, and publication of information on energy reserves, production, and consumption.

Mr. Evered has broad experience in areas of energy resource technology and management. Prior to his current appointment, he was with CER Corporation of Las Vegas, Nevada. Joining CER in 1978, he managed the Geotechnical Division and oil and gas consulting activities. he also directed a comprehensive research program in unconventional natural gas supply from tight formations.

From 1976 to 1978, Mr. Evered served as Energy Adviser to U.S. Senator Dewey F. Bartlett of Oklahoma. Legislation in which he had extensive involvement included the Natural Gas Policy Act, the Fuel Use Act, the Outer Continental Shelf Lands Act Amendments, and the Surface Mining Control and Reclamation Act.

His experience in the petroleum industry includes production and reservoir engineering positions at C. & K. Petroleum, Inc., Midland, Texas (1976); Phillips Petroleum Company, Odessa, Texas and Bartlesville, Oklahoma (1974-76); and Amoco Production Company, Houston, Texas (1973).

Mr. Evered was awarded a B.S. degree in Geological Engineering, with Distinction, from the University of Oklahoma in 1974. While at the University, he received numerous scholastic and leadership awards.

He is a member of the Society of Petroleum Engineers of AIME and has served as Vice President of the Independent Petroleum Association of Mountain States (IPAMS). Mr. Evered is the author of several papers and reports on energy technology and resource management.

Mr. Evered was born in Webb City, Missouri and raised in Bartlesville, Oklahoma. He currently resides in Arlington, Virginia, with his wife, the former Jane Greenleaf.

## Statement of J. Erich Evered
## Administrator, Energy Information Administration
## Department of Energy
## Before the
## Committee on Appropriations
## Subcommittee on Interior and Related Agencies

Mr. Chairman, Members of the Committee, I am pleased to be here today to present the proposed Fiscal Year 1983 budget for the Energy Information Administration (EIA). This request is $54.5 million and includes 415 full-time equivalent staff years. The purpose of my testimony today is to explain how EIA plans to accomplish its goals and objectives at this budget level during Fiscal Year 1983. As you know, the President's budget assumes continuation of the EIA as an independent bureau of energy information in FY 1983 within the Department of Commerce (DOC).

EIA's main statutory responsibility is to provide meaningful, timely, and accurate energy information to the Executive Branch, Congress, State governments, and the public so that those who make decisions about energy in all sectors of our society have the tools to make those decisions well. For the sake of simplicity I will refer to EIA but our agenda remains basically the same if Congress decides to transfer our functions to the DOC. In order to accomplish this goal, EIA collects, processes, and interprets energy data, and exercises independent judgment in the gathering, analysis, and dissemination of information. EIA also provides essential energy data collection, processing and analysis support to other energy programs, and it ensures the accuracy and validity of energy information of all types.

### BACKGROUND

Before I discuss the details of this budget request, which explains how EIA plans to meet its objectives in Fiscal Year 1983, I would like to briefly describe for you EIA's organizational structure and present some highlights of EIA's recent accomplishments.

In July of 1981, EIA underwent a major reorganization to enable the agency to achieve its objectives more efficiently. Organizing data gathering, interpretation and analysis functions by fuel type and by energy end use within program offices has led to a more focused use of resources, and has eliminated redundancies. These economies, along with the cessation of activities which supported petroleum regulation, have enabled EIA to continue its essential functions at reduced budget levels while improving the quality, timeliness, and usefulness of essential data series.

EIA's reorganization led to the establishment of three program operation offices, three program service offices, and an office which supports the Administrator in his overall policy and management activities. The budget has been restructured so that resource levels are accurately portrayed by these functional areas. In the Collection, Production, and Analysis area, the Office of Oil and Gas is responsible for data gathering, interpretation, and analysis in the areas of petroleum supply, petroleum marketing, natural gas supply, and oil and gas reserves. The Office of Coal, Nuclear, Electric and Alternate Fuels gathers, interprets, and analyzes data in its respective fuel areas. The Office of Energy Markets and End Use conducts statistical and forecasting programs concerning energy consumption and crosscutting energy topics. These include energy end use and prices, supply and demand balances, economic, international, and financial matters.

Three offices provide program services for the fuel-specific program offices. The Office of Automated Data Processing (ADP) Services operates the EIA computer facility, providing facility and telecommunications support, customer services, and ADP software support to EIA and other Department of Energy (DOE) components. The National Energy Information Center publishes and disseminates information and responds to public inquiries. The Office of Statistical Standards provides survey and statistical design, development of standards, coordination of standard definitions, and management of the DOE public use forms clearance process and respondent burden control program. This Office also verifies the quality and meaningfulness of energy information.

The policy and management area supports the immediate Office of the Administrator and the Office of Planning and Resources, which provides administrative support to EIA program offices in the areas of planning, budgeting, contract administration, personnel, and administrative services.

## FISCAL YEAR 1982 ACCOMPLISHMENTS

During Fiscal Year 1982, EIA accomplishments will include the preparation of about 80 periodic energy data reports and 50 one-time interpretive and technical reports, and response to over 70,000 information requests from the public. Additionally, the EIA will continue to respond to the Congressional and Presidential mandate to relieve the public of time-consuming reporting requirements by developing and implementing the DOE-wide Information Collection Budget. This program has been successful in leading to reduced respondent burden. Specific data projects are being restructured into integrated files and publications based on common characteristics, which will reduce operating and publication costs. The EIA is also completing the design of a comprehensive natural gas information system and an integrated petroleum product distribution and sales data system. Results from the Non-Residential Buildings Energy Consumption Survey, which filled the major commercial sector data gap, provided significant insight into this sector. The EIA is providing analytic input into DOE emergency preparedness activities, has conducted a study of the impact of financial constraints on the electric utility industry, and is analyzing the effects of accelerated deregulation of natural gas. The EIA will also complete several product quality assurance projects, including about 20 reports on data systems, models, and projections; archiving of all Annual Report to Congress models, verifying their documentation; and review of the statistical quality and accuracy of major analysis and data interpretation reports.

EIA has continued to receive high marks from Federal, State, and private sector decisionmakers for its products and services. This confidence and EIA's independence have enabled policy makers to focus on the direction of energy policy, rather than concerning themselves with the credibility of the information.

## PLANS FOR FISCAL YEAR 1983

As EIA prepares to enter Fiscal Year 1983 with a reduced level of resources, plans are being made to assure that EIA's basic statistical series are continued and that information products maintain their high level of quality. While some activities will be reduced or eliminated, those that remain will be subject to the same rigorous high standards.

At the Fiscal Year 1983 President's budget level of $54.5 million and 415 full-time equivalent staff years, most ongoing activities will continue, while others will be reduced or eliminated. In the Collection, Production, and Analysis area, EIA will continue to produce weekly, monthly, quarterly, and annual petroleum and natural gas data and short-term analyses. EIA will also conduct the annual oil and gas reserves and production survey and interpret the results. Support for the Federal Energy Regulatory Commission will be provided, as will most basic statistical collections. Short-term forecasting will continue with an extended time horizon. Integrative reports, such as the Monthly Energy Review, the State Energy Data Report, and the data volume of the Annual Report to Congress will continue. Supply disruption analysis will also continue.

Analytical activities proposed to be eliminated in FY 1983 include mid- and long-term analysis, Alaskan hydrocarbon analyses, and model simplification. State level data in support of the Emergency Energy Conservation Act and State-collected heating oil data will also be eliminated. The Financial Reporting System, the Energy Emergency Management Information Program, and the Quarterly Report to Congress will be discontinued. Additionally, plans to extend the level of detail of the Weekly Petroleum Reporting System to refinery district will be cancelled. Some of these activities have already been proposed for elimination in Fiscal Year 1982, and are contingent upon the passage of S. 1281, the "Energy Information Administration Amendments of 1981." Additional legislation will be proposed to eliminate the requirement to prepare mid- and long-term analyses. Other activities will be reduced in scope. These include crude oil imports data collection, the alternative fuels program, certain electric power data systems, further refinements to existing systems, and the frequency of collecting energy consumption data.

The activities in the Program Services area support the programmatic activities described above. In Fiscal Year 1983, EIA will continue to oversee the management and operation of the computer facility commensurate with the reduced analytical and data requirements of the continuing programs. EIA will continue to respond to inquiries requesting energy information. The forms clearance and burden reduction program will continue, as will the preparation of the annual Information Collection Budget. Those activities to be eliminated include the planned use of a satellite computer, the State liaison function, in-depth validation of data and models, field audits, and further development of the Data Resource Directory. Quality control reviews will be conducted by the offices responsible for data programs. Planned reductions include computer equipment such as fewer storage disks and terminals, and computer technical support related to reduced computer usage. The scheduling, printing, dissemination, indexing, and abstraction of EIA publications will be reduced to reflect the decreased number of publications. Statistical design activities will be reduced commensurate with the reduced number of systems, as will frames development and update and the archiving of EIA models.

Policy and Management activities, which support the Administrator in his overall guidance and management of EIA staff, will be reduced commensurate with program reductions. Continuing activities include the development and implementation of budgets, annual operating plans, and program plans. Activities to be reduced include the processing and monitoring of contract actions, personnel actions, and administrative support activities.

These plans reflect a change in direction in response to the Administration's overall energy policy of placing greater reliance on the free market in seeking solutions to the Nation's energy future. The demands of Federal program managers for detailed data needed to implement regulatory programs have been reduced; therefore, EIA's requirements as a support organization have been similarly reduced. In addition to the savings achieved by outright elimination of regulatory data collections, efficiencies are being achieved as a result of a more stable environment. Survey and systems redesign will be needed much less frequently, definitions can be standardized, and greater use can be made of sampling.

With respect to validations, that program effort over the past four years has covered most major information systems and has laid out an agenda of recommendations for achieving improvements. As we complete redesign efforts, as we are now doing with petroleum product marketing data, past validation reports serve as a major contributing factor to the redesign.

Finally, we are also planning to eliminate mid- and long-term modeling and forecasting. In the light of the current availability of some of this information from private sector sources, the inherent uncertainty that attaches to any longer-term projections, and the need to reduce government spending, we will propose legislation to eliminate this requirement. We will thus be focusing our analytical resources on interpretive analysis to turn raw statistics into relevant information, on examining alternative energy trends for the short-term, and on critical energy issues, such as natural gas decontrol.

This concludes my basic presentation of EIA's planned activities for Fiscal Year 1983. In planning these activities, it was essential to develop rational criteria for deciding which activities would be maintained, and which would be reduced or eliminated. Without the basic historical data series, the rest of EIA's activities could no longer be undertaken. It was, therefore, decided to maintain high utilization data series, while eliminating some systems of less utility. Quality data are essential for sound decisionmaking. In addition to essential data series, short-term forecasting will be maintained. Recent supply and consumption data on petroleum products, for example, will provide us with the tools we need to inform the public and private sectors about the expected supply of heating oil for the winter, or gasoline for the heavy summer driving period, to name just one application. Beyond the short-term, however, the many variables and uncertainties inherent in forecasting make the mid- and long-term forecasting activities less useful and overly costly. In addition, mid- and long-term projections made by outside sources are available to provide a range of possibilities of mid- and long-term energy situations. EIA will continue to maintain the basic tools for analysis of energy supply disruptions, and will maintain the basic data series that will enable the private sector or other government agencies to conduct mid- and long-term analysis, should they choose to do so.

In summary, while the EIA will not produce the same volume of information as it has in the past, I believe that EIA's FY 1983 budget will support a timely, relevant, high quality statistical program. EIA products will serve the information needs of energy decisionmakers in the Congress, the Executive Branch, the States, the private sector, and the public. I will be happy to answer any questions you may have.

### REDUCTIONS IN 1983 BUDGET

Mr. YATES. You don't have to read your statement because that is in the record. Just tell us what it is you think you need. I see you have got a cut of $24 million, right?

Mr. EVERED. Yes, Mr. Chairman.

Mr. YATES. That doesn't help you do your job, does it?

Mr. EVERED. Mr. Chairman, given the redirected emphasis of this Administration, I am fully confident that we will be able to satisfy the mission of EIA at the resource level requested for fiscal year 1983.

Mr. YATES. What was the phrase you used?

Mr. EVERED. Redirected emphasis of the Administration.

Mr. YATES. What does that mean? What is the redirected emphasis? Do you mean closing down the Department of Energy?

Mr. EVERED. No, sir, I am not speaking of closing down the Department, or dismantlement or reorganization, or whatever the fashionable term is this week. I am speaking of the Administration's placing greater reliance on the private sector in helping to solve the country's energy problems, and the impacts that that has on EIA's information programs.

Mr. YATES. I see. What is the role of the Government in all this?

Mr. EVERED. The role of the Government, in my view, is to monitor the energy marketplace and provide essential basic data to decisionmakers, private and public, thus assisting them in making informed decisions.

Mr. YATES. All right. Go ahead.

### SUMMARY OF EIA'S 1983 REQUEST

Mr. EVERED. I would be pleased to summarize my remarks in view of the fact that the full prepared statement has been entered for the record. As you stated, the budget request for the Energy Information Administration is $54.5 million. That includes 415 full-time equivalent staff years. The purpose of my testimony today is to explain how we plan to accomplish our goals and objectives at this budget level during fiscal year 1983. Plans are being made to insure that EIA's basic statistical series are continued and that information products maintain their high level of quality. The fiscal year 1983 request assumes discontinuation of some minimally used reports; incorporation of most quality control and validation activities into systems design and operation; and elimination of the requirement to conduct mid- and long-term analysis. The EIA will focus on basic national level energy statistics and analysis limited to current trends and projections up to 5 years. Legislation required to eliminate mid- and long-term projections will soon be proposed. Additionally, the Administration has already proposed legislation entitled the "Energy Information Administration Amendments."

### MID- AND LONG-TERM PROJECTIONS

Mr. **Yates**. Would you define what you mean by mid- and long-term projections, which is a phrase that you used?

Mr. **Evered**. Yes, sir. The Department of Energy Organization Act, and the balance of the organic legislation which created the Energy Information Administration and its predecessors, require EIA to conduct analysis and projections of energy futures in the short-, mid-, and long-term.

Mr. **Yates**. Would you define what you mean by short, mid and long term?

Mr. **Evered**. Certainly. I would define short term as up to 5 years or so in the future, midterm as 5 to 15 years, and long term, beyond that.

In the past, we have utilized rather complex, sophisticated computer models as tools in developing projections of the energy future. It is our feeling that the uncertainties inherent in longer term forecasting, the resource drain in conducting these activities, and its low priority relative to the other activities we are engaged in make it less desirable to continue these activities in fiscal year 1983, hence our recommendation to eliminate them.

Mr. **Yates**. How much of the $25 million reduction is attributable to short term, midterm and long term?

Mr. **Evered**. Approximately $6 million for the mid- and long-term analysis and projections combined. We will continue short-term analysis and projections.

Mr. **Yates**. Perhaps I misunderstood you. How do you break down the $25 million reduction between short-term, mid-term and long-term?

Mr. **Evered**. They do not constitute the entire $25 million. Of that $25 million, approximately $6 million is attributable to the combination of mid- and long-term analysis being eliminated. We will not eliminate short-term analysis.

Mr. **Yates**. You will not?

Mr. **Evered**. No, sir.

Mr. **Yates**. Go ahead.

### REQUESTED CHANGES IN LEGISLATIVE REQUIREMENTS

Mr. **Evered**. We have proposed legislation which would eliminate some reporting requirements and strengthen EIA's ability to protect our data. This has been introduced in the Senate as S. 1281. Although there has been no further action on that bill, we intend to continue pursuing its enactment. Our fiscal year 1982 and 1983 budget requests assume the passage of this legislation to relieve us of certain of our requirements.

Mr. **Yates**. What if it isn't passed?

Mr. **Evered**. If it isn't passed I will be in a position of requiring additional resources to conduct my activities.

Mr. **Yates**. How much?

Mr. **Evered**. I would be happy to provide that for the record.

Mr. **Yates**. Can you give us a ball park figure?

Mr. **Evered**. Ball park figure, the $25 million or more that we are speaking of.

[The information follows:]

## ADDITIONAL FUNDS IF S. 1281 IS NOT ENACTED

If S. 1281, the "Energy Information Administration Amendments of 1981" is not enacted, EIA would be required to carry out statutory requirements which were not included in the formulation of the fiscal year 1983 budget request. The programs in question include the Financial Reporting System, a Middle Distillate Monitoring System (required by the Emergency Energy Conservation Act), other EECA requirements, Coal Reserves Disclosure, and the Quarterly Report to Congress. The estimates contained in the January 1981 President's 1982 budget submission to Congress for these programs totaled $11.7 million. This consisted of $2.4 million for the Financial Reporting System, $9.2 million for all EECA requirements, and small amounts for Coal Reserves Disclosure and the Quarterly Report to Congress. However, these estimates were prepared during a time when a regulatory environment necessitated detailed data collection efforts that could possibly be used to support an emergency petroleum allocation program in the event of a shortage, or in the event of the implementation of State energy conservation targets, or in the event of some other Federal Government interventionist role. In the current environment these legislative requirements could, if necessary, be fulfilled through less detailed, less burdensome, and less costly reporting systems. EIA intends to carry out the provisions of legislation governing its activities to the extent possible with the resources that are available.

## EIA ACCOMPLISHMENTS

Mr. YATES. Go ahead.

Mr. EVERED. During fiscal year 1982 our accomplishments will have included the preparation of about 80 periodic reports and 50 one-time interpretive and technical reports as well as response to over 70,000 information requests from the public. Additionally, EIA is continuing its efforts to reduce respondent burden. Specific data projects are being restructured into integrated files and publications based on common characteristics, which will reduce operating and publication costs.

## EIA OBJECTIVES FOR 1983

In 1983, EIA will continue to produce weekly, monthly, quarterly and annual data and short-term analyses. EIA will also continue to conduct the annual oil and gas reserve surveys, and will continue its support for the Federal Energy Regulatory Commission. Short-term forecasting will continue with an extended time horizon.

Activities to be reduced or eliminated include mid- and long-term modeling and forecasting, as I have said, State-level data in support of the Emergency Energy Conservation Act, the financial reporting system, the energy emergency management information program and the quarterly report to Congress.

The planned extension of detail in the weekly petroleum reporting system will be cancelled. Other data collections such as oil imports, alternate fuels, certain electric power data systems and energy consumption data will be reduced in scope and frequency.

In summary, Mr. Chairman, while EIA will not produce the same volume of information as it has in the past, I believe that EIA's fiscal year 1983 budget will support a timely, relevant, high quality statistical program. EIA products will continue to serve the information needs of energy decisionmakers in Congress, the Executive Branch, the States, the private sector and the public.

That concludes my introductory remarks, Mr. Chairman. I would be delighted to respond to any questions you might have.

### IMPACT OF 1983 REDUCTIONS

Mr. **Yates**. Suppose the committee were to cut your budget by another $25 million, would that cripple you?

Mr. **Evered**. The word "cripple," I am not certain quite what you mean by that.

Mr. **Yates**. Would it hurt you? Would it hurt your activities?

Mr. **Evered**. A further cut from that which the Administration has proposed?

Mr. **Yates**. Yes, the Administration proposes a $24 million cut. You indicated that this is attributable to the redirected emphasis by the Administration toward the energy requirements of the country, as I recall.

Does that summarize what you said?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. All right. If that is true, why wouldn't it be advisable to help the redirected emphasis by increasing the cut?

Mr. **Evered**. My answer would be that increasing the size of the cut would not assist in the redirection.

Mr. **Yates**. Oh? How do you draw a line at $25 million as assisting the redirection, and then beyond that, not assisting the redirection?

Mr. **Evered**. It is not a matter of assisting the redirection but rather following from it. The redirected emphasis of the Administration in relying on the private sector permits us to save money and reduce the scope and depth of our activities.

Beyond that, to answer your question, yes, it would cripple my ability to comply with my required activities.

### PRIVATE SECTOR INFORMATION CAPACITY

Mr. **Yates**. Doesn't the private sector have the capacity for producing the statistical information that EIA produces?

Mr. **Evered**. They do not, not on the comprehensive, uniform basis with mandatory reporting which is within EIA's power.

Mr. **Yates**. How badly would the private sector be hurt, if your program were eliminated?

Mr. **Evered**. Well, that is hard for me to say. But if you asked them individually in various industry sectors, I think the answer would be, rather severely. They rely on us repeatedly for basic information in conducting their business, planning for the future, and monitoring the activities of the marketplace.

Mr. **Yates**. What is their attitude towards your reduction of $25 million?

Mr. **Evered**. Mixed. There is some concern about our ability to continue to serve their needs. On the other hand, there are many sectors of industry which would be pleased to see Government stop asking questions. It largely depends on——

### RESPONDENT BURDEN

Mr. **Yates**. Is your operation a burden on industry?

Mr. **Evered**. Mr. Chairman, we do not make up the numbers. Any number we publish results directly from a survey to gather the information from the primary source. The primary source is usually a company in industry. By definition, this places a burden on the respondent in going to the trouble of finding or generating, the number, filling out the form, and submitting it to EIA.

We are very conscious of the burden we place on industry, and do our best to minimize that. We are responsible for the Department of Energy as a whole in the area of monitoring and minimizing respondent reporting burden. I would add, by the way, that EIA comprises approximately 8 percent of the Department's total respondent burden on industry. The Federal Energy Regulatory Commission far and away comprises the majority of it, about two-thirds.

### IMPORTANCE OF ESTIMATES OF ENERGY RESOURCES

Mr. YATES. Well, your predecessor indicated, if I remember correctly, he stated in the medium term we have good reason to believe that estimates of resources being high or low will exert quite different effects on the domestic supply and thus would entail policy implications concerning planning for the medium term. Do you agree with this?

Mr. EVERED. Mr. Chairman, I am not certain in what context that statement was made. I would be constrained to decline responding to that without benefit of——

Mr. YATES. It was before a hearing that we had, as I recall. Well, this is taken from a book called the "Politics of Mistrust". And I read from page 274. This is a book by Wildavsky and Tanenbaum.

Are you familiar with it?

Mr. EVERED. I am aware of the existence of the book. I have not read it.

Mr. YATES. Yes. It says this:

> Whether an estimate of oil or gas resources matters for public policy depends on how sensitive that policy outcome would be to a specified difference in that variable. Our view of the key question, "What difference would different estimates of U.S. resources make?" suggests that these estimates would not matter significantly for energy policy-making. But, it is not enough to let the matter go at that. There are circumstances in which policymakers and planners do believe that resource estimates make a significant difference.

I would have thought so. That is my own statement. Now, back to the text.

> Many officials in the Department of Energy and Congress would agree with Lincoln Moses, head of Energy Information Administration who said: "Let us think of the next 10 to 20 years [1985 to 1995] as the medium term. Here, the size of undiscovered resource can be expected to affect supply and price, because the conversion of resources to reserves, and their development to production have time to go forward more slowly or more quickly as resources are perceived to be smaller or larger." While a price-theory perspective would lead one to suspect that energy policy in the midterm is not very sensitive to differences in U.S. resources estimates, there are other perspectives. Moses expresses that view of timing which dominates today's policy thinking.
>
> In the medium term we have good reason for believing that estimates of resources being high or low will exert quite different effects on the domestic supply and thus would entail policy implication concerning planning for the medium term "close cycle."

What do you think?

Mr. **Evered**. Mr. Chairman, I would agree that estimates of, for instance, oil and gas reserves are very important to energy policy making in this country, not only in the public sector but in the private sector.

Mr. **Yates**. Right.

Mr. **Evered**. Not only the given reserves level at a point in time, but the change in reserves over time. For instance, we are all quite concerned about the availability of domestically produced oil. Our reserves have been dwindling for some time at an alarming rate. However, our 1980 oil and gas reserves survey found that the change from 1979 to 1980 was a net zero, and that, in fact, we had maintained our crude oil reserves inventory over that year. That is a significant finding, and I very much look forward to seeing the 1981 numbers.

### ELIMINATION OF MID- AND LONG-TERM FORECASTING

Mr. **Yates**. Well, that brings me back to a previous question, then. If that be true, why then are you asking us to cut $6 million out for short- and medium-term information?

Mr. **Evered**. The cut which we propose is not in data gathering, but in forecasting the future. We feel that there are ample sources in the private sector providing a range of forecasts for the future that clearly would bound whatever EIA would forecast. Our guesses, predictions, or judgments, of the future are no better nor any worse than anyone else's.

The uncertainties inherent in any forecasting exercise render the resulting information highly subjective. We are going to concentrate on the basic data series, gathering the facts. We will continue the reserves survey. In addition, we will continue topical analysis of important emerging issues and projections into the extended short-term future, say 5 to 7 years.

Mr. **Yates**. Who uses your mid- and long-term estimates?

Mr. **Evered**. That is a question I have been asking my people. I am not certain who all of the users are. I suspect policy analysts and perhaps certain industrial and strategic planners view EIA's forecasts as the most credible in that they are not policy biased, nor tainted with a vested interest of a certain company or industry; so they are accepted on face value as a credible projection of the future. But they are highly uncertain.

Mr. **Yates**. What do you mean by highly uncertain?

Mr. **Evered**. They are highly uncertain in that they are not necessarily predictions of what will happen, but rather a judgment of what is likely to happen given a certain set of assumptions.

Mr. **Yates**. But isn't yours the best educated guess on the market?

Mr. **Evered**. I cannot say that in good faith, Mr. Chairman. I would say we are no better, nor any worse, than anyone else.

### PRIVATE SECTOR PROJECTIONS

Mr. **Yates**. All right. You said that the information that you would make available in this respect is already available to private industry. Did I misunderstand that statement?

Mr. **Evered**. My statement was, if I may clarify it——

Mr. YATES. Sure.

Mr. EVRED. Certain entities of the private sector, some for profit, some not for profit, conduct similar analyses and projections of the future. And the range of those projections brackets anything we have ever done.

Mr. YATES. Is a reasonable conclusion from what you have just said that your statistics for those periods, are no longer necessary?

Mr. EVERED. Yes, but I would not call them statistics. I would caution against using that word, for future——

Mr. YATES. Data?

Mr. EVERED. Projections.

Mr. YATES. Projections, all right. Are the projections that you say are available to private industry now available throughout private industry? For example, are the projections that Standard Oil of Indiana makes, for example, available to Atlantic Richfield or some of the other companies?

Mr. EVERED. Yes, they are published. In addition, many are made available by organizations which do this as a business. For instance, the econometric forecasters, Chase, Wharton, DRI; Congressional Budget Office does some, Office of Technology Assessment, Electric Power Research Institute, and various other associations.

Mr. YATES. Is it a correct conclusion to draw from your testimony, then, that your projections would be duplicative of theirs?

Mr. EVERED. Yes.

Mr. YATES. Would your answer be tempered by your previous answer, that your projections are acceptable, where some are not because yours are unbiased and unprejudiced?

Mr. EVERED. Yes, I would so temper my response.

Mr. YATES. You would?

Mr. EVERED. Yes.

Mr. YATES. So, even though you are duplicative, as far as some users are concerned, and we don't know who they are yet, because you have indicated you don't know who the users are——

Mr. EVERED. That is correct.

Mr. YATES. As far as some users are concerned, the information that you produce is more reliable than that produced in private industry because of the bias factor?

Mr. EVERED. It is viewed as such, yes, by many users.

Mr. YATES. If that is true, why do you eliminate it?

Mr. EVERED. It is a matter of priorities. Within the constraint of the reduced budget environment throughout the Government, this activity is of a lower priority than the basic fact gathering and analysis which we do.

Mr. YATES. Okay. So, what you are saying, then, is that you have been cut a certain amount of money by OMB, therefore you have gone through all of your activities, and you have decided that while all of them are important, this is the least important?

Mr. EVERED. Yes, sir.

Mr. YATES. All right. Well, how badly will the Nation be hurt for the lack of the $25 million? If I can draw a conclusion from your testimony, the reason for the cut is that the information is available from other sources. However, your information is considered to be more reliable than the information from other sources because of the possibility of bias or prejudice in other sources.

But, in view of the cut, your information will not be available, therefore, the industry must rely upon sources which they must recognize may be tainted because of prejudice, is that correct?

Mr. **Evered**. Some of them may be; not all of them suffer from that stigma.

Mr. **Yates**. Are there any that do not?

Mr. **Evered**. Many of the major banks conduct such forecasts and many of the so-called think tanks do.

Mr. **Yates**. Do they try to achieve a result, an end result with their information? A certain goal?

Mr. **Evered**. Not to my knowledge, no.

Mr. **Yates**. Well, then, you're saying they aren't tainted. I see.

Mr. **Evered**. No, not all of them.

Mr. **Yates**. Well, if that is true, and their information is available, there is no need for your information.

Mr. **Evered**. That is the basis of our cutting there.

Mr. **Yates**. I see. Well, was this the fact last year, as well?

Mr. **Evered**. It has been the fact ever since EIA's creation.

Mr. **Yates**. Then the committee was wrong in putting the $25 million in last year, wasn't it?

### EIA ACTIVITIES REQUIRED BY LEGISLATION

Mr. **Evered**. I would not say so. The fact is that this is an activity required in our organic legislation.

Mr. **Yates**. If it is an activity required in your organic legislation why are you cutting it out?

Mr. **Evered**. We are proposing to eliminate it and we will submit legislation to do so.

Mr. **Yates**. When you say you will submit legislation to eliminate it, hasn't that legislation been pending for some time in the Congress?

Mr. **Evered**. Not this specific item, no, sir. This one has yet to be submitted.

Mr. **Yates**. I see.

Mr. **Evered**. This is tagged to the 1983 budget submission. You may recall a package of amendments which were submitted a year ago in support of our 1982 budget submission.

Mr. **Yates**. So, that the legislation was wrong, then, in requiring it?

Mr. **Evered**. I am not going to say that it was wrong.

Mr. **Yates**. You are not going to say it was right?

Mr. **Evered**. In my judgment, given the need to reduce spending, it is time to start establishing some priorities and eliminating activities that are judged to be non-essential.

Mr. **Yates**. That are judged to be non-essential by whom?

Mr. **Evered**. By the collective wisdom of the Congress and the Administration.

Mr. **Yates**. Well, the collective wisdom of the Congress has not operated on this yet, has it?

Mr. **Evered**. That is correct, it has not.

Mr. **Yates**. What would you recommend to the collective wisdom of the Congress, to eliminate it?

Mr. EVERED. My recommendation to you, Mr. Chairman, is that these activities which we propose to eliminate be dispatched forthwith.

Mr. YATES. And why is that again? Because it is available from other sources?

Mr. EVERED. The mid- and long-term forecasting numbers are available from other sources for those users who find it necessary to have numbers about the future. My feeling is they are not all that essential. And the uncertainties inherent in any forecasting activity render the information so subjective as to be less than fully useful.

Mr. YATES. Well, if that is true, then the Congress was in error in passing the original legislation, right?

Mr. EVERED. Perhaps.

Mr. YATES. Why in the world would Congress pass that original legislation and incur all of this expense if the information is available from outside sources? Doesn't make sense, does it?

Mr. EVERED. I do not know why they did it.

### CONFIDENCE IN PRIVATE SECTOR PROJECTIONS

Mr. YATES. Yes. They were ill-advised. Possibly because there was some mistrust of the data that was available.

Mr. EVERED. Perhaps so.

Mr. YATES. You don't distrust the data that is available?

Mr. EVERED. I understand the information that is available, and the limitations on its usefulness.

Mr. YATES. I see. All right, suppose you were in private industry and you had a chance to evaluate the data from private industry with that which was available from this Government source. Which would you be inclined to rely on more?

Mr. EVERED. Mr. Chairman, I have been in private industry.

Mr. YATES. I know you have.

Mr. EVERED. What I would rely on is my own judgment.

Mr. YATES. Right.

Mr. EVERED. I wouldn't say I would rely on one forecast or another because of the——

Mr. YATES. Would you feel a loss if the Government source was not available for you to exercise your private judgment?

Mr. EVERED. No, I would not.

Mr. YATES. You would not?

Mr. EVERED. I would not.

Mr. YATES. That data is really of no importance, then?

Mr. EVERED. It is not cost effective. It is not worth the money expended.

Mr. YATES. I see. In other words it is not worth $6 million?

Mr. EVERED. That is correct, Mr. Chairman.

### VALUE OF EIA MID- AND LONG-TERM FORECASTING

Mr. YATES. How much is it worth? Suppose it were $3 million?

Mr. EVERED. The manner in which we have conducted this analysis and forecasting utilizes large computer models which are expensive to run and require many people to care for and feed them. That is the source of the bulk of the expense. It would be possible at a minimum resource level to maintain smart people with sharp pencils and desk top calculators to make prognostications.

However, there would be serious limitations on the usefulness of the resulting numbers. It is an activity which is inherently uncertain and based on assumptions which may or may not come to pass.

Mr. YATES. Is the use of models accepted as being the principal source, or the best source of information?

Mr. EVERED. In terms of quality, I am not certain. In terms of objectivity, and repeatability and documentability, yes, they are.

Mr. YATES. To what extent does the budget reduction reflect an emphasis on secondary sources versus primary sources?

Mr. EVERED. To no substantial degree that I can recollect. We will continue to rely on primary sources of information for all of our critical, basic-energy statistical series.

Mr. YATES. Well, you are going to have to go to Standard Oil now, or one of the other private companies, aren't you?

Mr. EVERED. As a source of what, sir?

Mr. YATES. Information, projections.

Mr. EVERED. No, sir. Oh, projections of the future?

Mr. YATES. Yes.

Mr. EVERED. We will not, say, go to a Standard Oil Company or a large coal company for projections of the future. We will rely on our own judgment. However, we will not publish our own forecasts of the long-term future.

Mr. YATES. $6 million was used for the gathering of that information. Could a greater sum have been used with additional tests for the gathering of that same information?

Mr. EVERED. $6 million was used for the design and running of various models to forecast the future. There was little data gathering in the process. Yes, more money could have been expended. I doubt that more money could have been expended wisely or efficiently.

Mr. YATES. How important is it to have projections of the future available now? We are told that we have an oil glut. Department of Energy is also proposing elimination of funding for conservation programs. How in the world are you going to know what to do in the future if you eliminate your sources of information?

Mr. EVERED. We will continue providing all of the important basic data on supplies of oil, gas, coal, electricity and other fuels, the information upon which to make decisions, and upon which industry and the public sector are so dependent.

We will continue to provide projections of what is likely to happen in the immediate future of up to, say, 5 to 7 years. We will discontinue the highly uncertain and less than fully reliable activity of trying to predict what is going to happen 10, 20, 40 years in the future.

## ACCURACY OF PROJECTIONS

Mr. YATES. How accurate have your predictions been?

Mr. EVERED. Not very.

Mr. YATES. Not very.

**Mr. EVERED.** It is hard to say, actually, because we have never gotten there. For mid- and long-term forecasts of 10, 15, 20 years or more into the future, we are not there yet, so we can't evaluate how they compare to history.

My answer that they are not very accurate is based on my observation that outyear forecasts made from one year to the next varied. It seems to me if you go from one year to the next, say from 1980 to 1981, your prediction of what is going to happen in the year 2000 can't vary all that much. But the actual forecasts have changed markedly over the years for the same target year. That, in part, has led to my judgment that outyear forecasts are not very reliable.

### RELEVANCE OF EIA INFORMATION

**Mr. YATES.** How do you insure your data collection efforts will be relevant to policymakers?

**Mr. EVERED.** I will continue to work and communicate closely with policymakers in the Department, elsewhere in the Administration, and in the Congress to determine what their needs are. I continually seek to find what kinds of information would be useful to decisionmakers. But I would emphasize that in the conduct of my responsibilities in gathering and analyzing data, I operate independently of any policy position.

**Mr. YATES.** All right. Why do you think we have to continue to provide information with respect to oil and gas? Why do we have to continue to provide any information at all? If we don't have to do it for the projections, why should we have to do it for anything?

**Mr. EVERED.** It is my strong feeling that it is inherently a Federal Government role to provide baseline statistics to monitor the behavior of the marketplace, and to be confident of the availability of energy resources to insure the economic health of the country.

**Mr. YATES.** Why monitor that activity? Why not just rely on the private sources as the Administration says you are going to do now?

**Mr. EVERED.** We will rely on private sources for the operation of the marketplace. The Federal Government should gather the information in a central and coordinated manner to provide the independent source of that data.

**Mr. YATES.** How independent will you be? I thought you said you are going to rely on the private sources for your information.

**Mr. EVERED.** There is little connection whatsoever between the gathering of data and statistics, the gathering of facts, and the forecast of the future. The elimination of mid- and long-term forecasting and analysis will impact not at all our ability to continue gathering, analyzing and disseminating important basic energy data.

**Mr. YATES.** What you are saying, if I understand you correctly, is: We will gather all the information, but we will not make any forecast based upon it.

**Mr. EVERED.** We will forecast the short term only, yes.

**Mr. YATES.** For the next 5 years.

**Mr. EVERED.** Yes, sir.

Mr. **Yates**. Did I misunderstand you? I thought you were eliminating forecasts for the next 5 years because of the $6 million cut.

Mr. **Evered**. That is not included in the $6 million cut. We will maintain that capability.

Mr. **Yates**. You are going to maintain short term and eliminate midterm and long term?

Mr. **Evered**. Yes, sir.

### OIL AND GAS RESERVES SURVEY

Mr. **Yates**. I see. Could you tell the committee who the users are of the Oil and Gas Information System?

Mr. **Evered**. The Oil and Gas Information System is no longer an operative name. It refers to our oil and gas reserves survey and the resulting data and publications. It is an annual survey of the reserves inventory of crude oil and natural gas and natural gas liquids in this country. It has historically been conducted by the major trade associations, the American Petroleum Institute and the American Gas Association. The EIA is required by law to conduct this annual reserves survey. The trade associations I named chose to maintain a 3-year overlap in their annual conduct of the survey, the reporting years 1977, 1978, and 1979, after which they discontinued their survey. For 1980 and subsequent years, EIA is the only source of U.S. crude oil, natural gas and natural gas liquids reserves.

The users of the data are decisionmakers, and policymakers in the Administration and the Congress; they are also companies in the oil and gas industry of all sizes and descriptions, producers, service companies, contractors and the like. It is by consensus an essential activity.

Mr. **Yates**. Is that information system valuable in the congressional debate as to whether to decontrol natural gas?

Mr. **Evered**. Yes, it is.

Mr. **Yates**. Did I understand you to say that system is no longer in existence?

Mr. **Evered**. That system will continue, though the name was recently changed. The trade associations discontinued their conduct of those surveys on their own when they felt confident that EIA's survey was valid and would continue.

Mr. **Yates**. Are the funds for continuing that survey being cut in this budget?

Mr. **Evered**. No, sir.

Mr. **Yates**. Are they being increased?

Mr. **Evered**. No, sir.

Mr. **Yates**. Should they be increased?

Mr. **Evered**. No, they should not be increased. The system operates efficiently and effectively at the level it is being funded, and I am confident of its integrity.

Mr. **Yates**. Did you make provision for inflation in the costing of that system?

Mr. **Evered**. Inflation is offset by our continuing efficiency improvement in the conduct of the system.

Mr. **Yates**. I see. You mean as inflation sends the costs up, you have a corresponding improvement that keeps the balance level?

Mr. **Evered**. From 1982 to 1983, yes.

Mr. **Yates**. I see. I must say, you are pretty expert.

## REQUEST FOR COLLECTION, PRODUCTION, AND ANALYSIS

All right, let's talk about collection, production and analysis. Your emphasis is on supply information rather than on end-use information. Is my interpretation of your justification correct?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Now, you want $13,780,000 for oil and gasoline information, and you want $6 million for coal, nuclear, electric and alternate fuels. Now you also want $2,100,000 for energy markets and end use. Why is there a large disparity on the importance you assign these programs?

Mr. **Evered**. There is not a one-for-one comparability among those programs. It is inherently more expensive to conduct oil and gas data collection than it is some of the other information.

## CONSUMPTION DATA

Mr. **Yates**. Isn't consumption data collection just as important as supply side?

Mr. **Evered**. Yes, I would say it is.

Mr. **Yates**. Yes. Then why shouldn't it receive more money then?

Mr. **Evered**. Because consumption is a different kind of data collection. It is more conducive to sample surveying, as opposed to the universe census of major refining companies. We find that more money is required to continue to collect oil and gas supply information than coal and electric supply information, and in turn, more expensive there than to collect certain essential consumption data. We will not discontinue our activities in the consumption area. It is an area in which I personally am very interested.

Mr. **Yates**. But you don't recommend as much money for that as you do to other components of the data collecting chain, do you?

Mr. **Evered**. That is correct.

Mr. **Yates**. What about industrial consumption, what do you propose to do about that?

Mr. **Evered**. We have no specific plans in fiscal year 1983 to conduct new industrial consumption data surveys. However——

Mr. **Yates**. Shouldn't you have?

Mr. **Evered**. It need not happen in 1983.

Mr. **Yates**. Will it have to happen somewhere along the line?

Mr. **Evered**. I plan to look into the industrial consumption area in the future. This is an area——

Mr. **Yates**. Short, midterm or long?

Mr. **Evered**. Soon.

Mr. **Yates**. Is that short, midterm, or long?

Mr. **Evered**. It is certainly short term.

Mr. **Yates**. I see, within the next 5 years.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. I see. What happens within the next 5 years then? Will industries have to wait until you make up your mind, or what? Does it really depend upon when you can ask for money?

Mr. **Evered**. Industry is not clamoring for these data.

Mr. **Yates**. Who is? Is anybody clamoring for it?

Mr. **Evered**. No, I would say no one is clamoring for it, although, as Administrator of EIA, I feel that this is an important segment of the energy chain and, in fact, the industrial sector is the largest gap we have in consumption data.

### FUNDS NEEDED FOR CONSUMPTION SURVEYS

Mr. **Yates**. Right. That being true, how much money do you need for it? Suppose the committee, the Congress, were to make funds available for what you have indicated a few moments ago is an important activity. You said you thought consumption data was a very important activity. Does that mean you would or would not want money for that purpose?

Mr. **Evered**. At this point, I have no plans in place or program designed to implement an industrial energy consumption survey in fiscal year 1983. We have, in the recent past, attempted to conduct such a data collection program which was recognized a couple of years ago as information which was needed. This survey of large combustors was designed and implemented to collect consumption data in the manufacturing sector. The Office of Management and Budget originally agreed with the Energy Information Administration that these data were desirable to collect and approved the data collection instrument——

Mr. **Yates**. You believe that information is very valuable, don't you?

Mr. **Evered**. Yes, I do.

Mr. **Yates**. How much money did you ask OMB for that purpose?

Mr. **Evered**. For fiscal year 1983?

Mr. **Yates**. Yes.

Mr. **Evered**. I do not recall asking for any funds in 1983 for this purpose. However, I did reserve the option of pursuing it in the future. It is not something that necessarily needs to take place on an annual basis.

Mr. **Yates**. I would agree with that. But I thought I understood you to say that it had been submitted to OMB and OMB eliminated it.

Mr. **Evered**. The original data collection instrument was submitted to OMB and was approved, and the collection took place. However, before all returns were in, OMB changed their mind and withdrew approval of the data collection form.

Mr. **Yates**. How much money had been requested of OMB at the time approval was withdrawn?

Mr. **Evered**. It was not tied to the appropriation for that program. It was simply OMB's exercising their authority to approve public use data forms. It was not tied to the budget for that program.

Mr. **Yates**. Were there no calculations in your office or Agency to be included in the budget for this purpose?

Mr. **Evered**. Not for fiscal year 1983.

Mr. **Yates**. Were there for 1982?

Mr. **Evered**. I do not recall. That was before my arrival at the Agency.

Mr. **Yates**. Do you have any staff members who could help you with this?

Mr. **Evered**. Yes, sir. Mr. Chairman, I am advised that, indeed, it was at one point included in the budget and did not survive the House-Senate Conference, and was stricken.

Mr. **Yates**. How much was it?

Mr. **Evered**. $2 million.

Mr. **Yates**. $2 million. All right. Which would you think would be more important to fund, the projection item that is being stricken out in your budget request, or a provision for $2 million for industrial consumption? It is a relative matter, I know, but which would you find to be more important in your judgment?

Mr. **Evered**. If we were to consider a $2 million level——

Mr. **Yates**. Staff shows me now the level was not $2 million but $2,779,000, The report of our last appropriations bill as issued by the House says this. "The Committee has restored the $2,779,000 eliminated in the revised budget for Emergency Energy Conservation Act consumption data and for full scale surveys in the commercial and industrial sectors. The consumption data is needed to determine the characteristics of energy use in buildings and by equipment."

Mr. **Evered**. If I may, Mr. Chairman, the difference between that figure and the $2 million I mentioned is the addition of commercial sector data, industrial plus commercial, came out with the $2.8 million. To return to your question——

Mr. **Yates**. Given a choice——

### EIA PRIORITIES

Mr. **Evered**. I have not considered that comparison directly before. Given a choice, if I could nominalize it at the $2 million level, bringing the $6 million for the mid- and long-term analysis down to the $2 million level and choose between the two; right now, I would say that it would be more valuable to the Agency and to the Government, at an incremental $2 million funding level, to maintain the analytical resources which could be brought to bear for mid- and long-term analysis and possibly forecasting.

That would not sustain the massive computer models which we have used in the past. But the analytical capability, the talented people who would be supported at that level would be more valuable in the short run than would be $2 million worth of——

### STAFFING FOR MID- AND LONG-TERM ANALYSIS

Mr. **Yates**. How many of those people are you going to lose with the $6 million cut?

Mr. **Evered**. I do not recall. Just a moment, Mr. Chairman. About eighty people.

Mr. **Yates**. Are you losing them already?

Mr. **Evered**. Yes, sir. Unintentionally, I assure you.

Mr. **Yates**. Well, I would think if I were one of those people I would be looking elsewhere, wouldn't you?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Will your operation suffer as a result of losing them?

Mr. **Evered**. We propose to eliminate that activity in fiscal year 1983.

Mr. **Yates**. I take it the answer to my question is yes.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. How many of the 80 have you already lost?

Mr. **Evered**. I am not certain. Attrition is a continuing process. We lose people in that area as well as the data collection area.

Mr. **Yates**. Do those people advise you of the fact that they are looking elsewhere?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. How many of the 80 have so advised you?

Mr. **Evered**. Directly, a handful. Indirectly, several more than that.

Mr. **Yates**. A handful. A handful is five?

Mr. **Evered**. A handful is five.

Mr. **Yates**. That is all you have lost out of the 80?

Mr. **Evered**. No, sir, those are the ones that have directly discussed the matter with me. Many more than that have——

Mr. **Yates**. Have not discussed it with you? They are just trying to survive.

Mr. **Evered**. Trying to secure a more predictable career future, more stability.

### EIA STAFFING LEVELS

Mr. **Yates**. Is the same thing happening in other parts of your Agency?

Mr. **Evered**. Yes, sir, we have significantly reduced our required staffing levels over the last couple of years from something approaching 800 in fiscal year 1980, I believe, to a current staffing level of approximately 550, plus or minus.

Mr. **Yates**. If that is true, how reliable is the data you are putting out?

Mr. **Evered**. I find the data quite reliable. Much of the staffing was superfluous.

Mr. **Yates**. Really. How much of the staffing was superfluous?

Mr. **Evered**. Let me answer it this way: At my current staffing level, I am able to do the job efficiently. The data products and the publications are being produced on schedule with high and improving quality.

Mr. **Yates**. So, if I understand you correctly, your current staffing level is 556 employees.

Mr. **Evered**. That is my current level.

Mr. **Yates**. That is your current level. Now, you hope to get down to 392 emloyees by the beginning of the next fiscal year.

Mr. **Evered**. Full-time permanent employees, yes, sir.

Mr. **Yates**. You are going to be more efficient with that number of employees?

Mr. **Evered**. I will be conducting fewer activities, as well as being more efficient.

Mr. **Yates**. I remember examining some witnesses last year—I think they were somewhat more uncomfortable than you seem to be—but their reply when I asked them, "How are you going to be able to handle your responsibilities with fewer employees?" was "We have to get smarter."

Mr. **Evered**. Mr. Chairman, I would submit that we are already very smart. We are getting better and more experienced.

Mr. **Yates**. All this is without overtime?

Mr. **Evered**. I would not say that.

Mr. **Yates**. Are you going to be doing any contracting?

Mr. **Evered**. Yes, sir.

We will not do an additional amount of contracting. We will maintain basically the same, or slightly reduced, level of contracting as now, relative to our overall funding level. The absolute level will go down.

### PROGRAM ELIMINATIONS AND REDUCTIONS

Mr. **Yates**. You said that you will not be undertaking as many activities with 392 employees. Which activities will you not be engaged in at the start of the fiscal year?

Mr. **Evered**. We will discontinue the mid- and long-term forecasting.

Mr. **Yates**. Yes.

Mr. **Evered**. Also the *Quarterly Report to Congress*, which is redundant to other reports which we submit; the Financial Reporting System; the middle distillate monitoring system resulting from the Emergency Energy Conservation Act; and petroleum regulation data which, of course, went by the wayside with crude and petroleum product decontrol. We will reduce our activities in support of many of the Department's program areas as the programs in conservation, solar, fossil energy and the like are reduced.

We will discontinue certain of our low utilization data series. We have abandoned use of a backup satellite computer which, frankly, was based upon higher utilization than in fact we found we were going to need.

In addition, there will be general reductions in support to the Department and other parts of the Government.

Mr. **Yates**. Will you be losing more than 160 employees by the end of the fiscal year?

Mr. **Evered**. No, sir, I expect not.

### EIA EMPLOYEES

Mr. **Yates**. I know you will probably go back to private industry when you leave this position, but what happens to your Federal employees? Won't many of them be looking around for other jobs under the assumption that there is another year of this Administration, and that there will probably be further employee reductions?

Mr. **Evered**. Mr. Chairman, I am very concerned about the personal and professional welfare of the employees in the Energy Information Administration. I am confident that the employees understand that. Many of them are highly skilled, highly sought-after professionals who have excellent opportunities for employment in the private sector. That does not diminish their importance to the public sector. I am doing everything I can to assure that those skilled, experienced professionals who are essential to our continuing activities do remain in the organization.

### NATIONAL OIL IMPORT REPORTING SYSTEM

Mr. **Yates**. One notes from page 116 of your justifications you are proposing to eliminate the National Oil Import Reporting System. What will you substitute for it, if anything?

Mr. **Evered**. Mr. Chairman, this was designed to be a substitute for the data gathering systems we already have in place. It was an advancement which we had contemplated making in cooperation with the Customs Service which we have abandoned for various reasons, including the budget reductions. I am confident in our ability to continue gathering essential oil imports data with the systems we have in place.

Mr. **Yates**. So, there was really no need for it?

Mr. **Evered**. That is correct.

Mr. **Yates**. Do you lose any information by eliminating the system?

Mr. **Evered**. No, sir.

Mr. **Yates**. Is there a question of obtaining that data in the same length of time?

Mr. **Evered**. I am not certain what you are asking.

Mr. **Yates**. You say you will be able to obtain that information from other available sources. Would you be able to obtain that information within the same period of time?

Mr. **Evered**. Based on my understanding, yes, sir.

### FREQUENCY OF CONSUMPTION SURVEYS

Mr. **Yates**. On page 118 you say a commercial non-residential survey will be done approximately every 3 to 4 years. Do we lose anything of value by stretching the time for the surveys by 3 to 4 years?

Mr. **Evered**. I think not, Mr. Chairman, because what we are trying to capture are changes in the consumption patterns, and it is a rather evolutionary rather than revolutionary process. Doing it every 3 or 4 years would easily capture these changes.

Mr. **Yates**. How often are you doing these surveys now?

Mr. **Evered**. To my knowledge we have done it once.

Mr. **Yates**. Over how many years?

Mr. **Evered**. Last year.

Mr. **Yates**. Last year was the first time you did it?

Mr. **Evered**. Yes, sir. The first results were published last year; the survey was conducted in 1980.

Mr. **Yates**. Will there be any advantage in doing the survey on an annual basis?

Mr. **Evered**. Not relative to the cost, Mr. Chairman.

It is a matter of how much data is enough. And in my judgment, every 3 or 4 years for the commercial consumption data is quite sufficient.

## ASSUMPTION OF DOE DATA COLLECTION ACTIVITIES

Mr. YATES. Why are you assuming all the data collection activities from the rest of DOE?

Mr. EVERED. We are not assuming them. We have always had them. We have always had the central responsibility to provide data support to the program areas of the Department of Energy. Frequently the EIA Administrator has redelegated that responsibility—

Mr. YATES. Take a look at page 127, middle column, third item down. It says, "Assume data collection activities from the rest of DOE".

Mr. EVERED. That does not refer to all of it. It simply speaks to the fact that there will be some data collection activities which have been conducted by program areas of the Department which will be discontinued for their purposes, but certain data elements of which might be essential for our continuing statistical series. We will assume the remaining portion of the data collection.

I am advised by staff that the reference there is to a specific program.

There were two or three specific data collections which were conducted by the Office of the Assistant Secretary for Nuclear Energy in the Department of Energy. We have assumed responsibility for those data collections and I am advised that that is what this was in reference to.

Mr. YATES. Well, then, you look at the third column, you say you are going to "Consolidate data collection activities previously performed by other organizations; continue periodic reports, but initiate no new special studies. . . ."

Will you be able to accept the additional data collection activities of other organizations with your present staff?

Mr. EVERED. Yes, sir.

Mr. YATES. What is involved in that?

Mr. EVERED. Not a great deal of resources. This is more in reference to what I mentioned earlier, that frequently a comprehensive data collection is carried out largely in support of a program area or a regulatory activity in the Department.

As the need or justification for that comprehensive data collection is reduced, the program area may elect to discontinue the data collection. However, certain of the data elements may be of importance to EIA in our basic statistical series, and we will take over the consolidated, reduced data collection on our own.

But it is not a large resource consumer.

## FREQUENCY OF RESIDENTIAL CONSUMPTION SURVEY

Mr. YATES. What is the interval of the survey and reports that you now make for residential energy consumption patterns?

Mr. EVERED. To date, we have conducted three of them and they were approximately 1 year apart.

Mr. YATES. I see. What will the interval be under the 1983 budget?

Mr. EVERED. 2 years.

Mr. YATES. Is anything lost by extending the interval?

Mr. EVERED. I think not.

### IMPORTANCE OF STATE-LEVEL DATA

Mr. **Yates**. You think not. How important is the collection of State-by-State data for emergency preparedness purposes?

Mr. **Evered**. It is my feeling that the data we collect currently are sufficient to establish the baseline information needed for emergency preparedness and that the State-level, product-specific reporting contemplated in EECA is not necessary, nor desirable. We continue to hold emergency preparedness data collection a very high priority in EIA.

As I have testified before the subcommittee chaired by your colleague, Mr. Sharp, we will continue to emphasize our efforts in that area.

### USERS OF COMMERCIAL CONSUMPTION INFORMATION

Mr. **Yates**. You have had two reports on commercial energy consumption and the first national statistical data collection from a sample of commercial buildings. Who uses these reports?

Mr. **Evered**. We have a broad array of users of that information, such as high-technology companies contemplating the marketing of energy management systems to building owners; energy-related product manufacturers, various industries, State energy offices, universities, and the like.

Mr. **Yates**. Are the reports capable of distinguishing energy conservation which may be caused by any slowdown in the economy as opposed to conservation which may result from increasing prices?

Mr. **Evered**. Possibly, although I would have difficulty pointing my finger at just how that would be done.

Mr. **Yates**. Yes, where the line would be drawn. Can your reports be used to quantify conservation efforts?

Mr. **Evered**. Yes.

### NATURAL GAS MARKET INFORMATION

Mr. **Yates**. Your annual report for 1981 says:

> EIA will be closely monitoring the natural gas marketplace to ensure that the decisionmakers are adequately provided with the information needed to make essential decisions.

Is that still true?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. How do you go about insuring you are going to have all that information?

Mr. **Evered**. We have recently done a comprehensive review of the kinds of data relative to the natural gas marketplace which the Government and private decisionmakers need.

We have identified gaps in the data which we needed to fill, and we have gone after those data.

Specifically, natural gas producer-pipeline contracts and price escalation clauses therein can have the effect of artificially inflating the wellhead price of gas beyond the level to which it would go in a perfectly free market. It is a serious problem which we are analyzing very closely and we are providing information to the Congress and the Administration.

## FINANCIAL REPORTING SYSTEM

Mr. **Yates**. The Financial Reporting System, the report for 1980. Is 1980 the last year for which this report will be issued?

Mr. **Evered**. If the Congress accepts the Administration's proposal to discontinue the requirement for a Financial Reporting System, that will be the last report.

Mr. **Yates**. Do you think it should be?

Mr. **Evered**. Yes, sir. I strongly feel that it should be discontinued.

Mr. **Yates**. Why?

Mr. **Evered**. It is an expensive, burdensome program, the most burdensome survey which EIA conducts. The information gained is available from other sources.

Mr. **Yates**. What other sources?

Mr. **Evered**. Such as the Securities and Exchange Commission, and from companies' annual reports. I cannot justify the data collection.

Mr. **Yates**. Well, is it available from other reports collectively, and do you serve a useful purpose by putting it into one report?

Mr. **Evered**. I do not see that the benefit of our consolidating such information into a single report justifies the cost and burden.

Mr. **Yates**. How valuable is the report?

Mr. **Evered**. Not very valuable, in my opinion.

Mr. **Yates**. Is your opinion shared by the industry, for example, or by others who are in the energy data business?

Mr. **Evered**. Yes, it is.

Mr. **Yates**. Okay. Are you aware of this report entitled "Performance Profiles"?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. How good is it? Not very good?

Mr. **Evered**. It is good. It is not useful.

Mr. **Yates**. Okay.

Mr. **Evered**. If I may clarify that, I will not——

Mr. **Yates**. You mean written well?

Mr. **Evered**. It is written well; the data are of high quality and validity. I will release nothing for publication which I am not confident is of the highest quality we can produce.

My point is that the data contained in that report are not of much usefulness, and do not justify the cost and burden on respondents to conduct the survey.

## CONVERSION OF REGULATORY TO STATISTICAL SYSTEMS

Mr. **Yates**. What do you mean by the phrase "converting regulatory programs to statistical systems"?

Mr. **Evered**. When gathering information for a regulatory purpose, one needs to get the information from a universe of companies because you are going to need information on each specific company for implementation of a regulatory program.

However, if the information you need is only for statistical purposes, you need not go to each and every company.

You can establish your universe, your frame. A frame is the term we use for a list of all establishments, with their addresses and attributes, within a given population, say, all heating oil dealers, or all major petroleum refiners, that sort of thing.

You can scientifically design a sample of that universe, of that total population, which will yield the statistical information you need with very high validity and reliability without having to bother each and every member of the group.

### INFORMATION REQUIREMENTS OF PETROLEUM ALLOCATION ACT

Mr. **Yates**. Congress just passed the Emergency Petroleum Allocation Act. What is it going to cost to carry out the provisions of the act?

Mr. **Evered**. We have not examined the act for implementation. It has not been signed into law. The conference report has been passed by both Houses and it is on the President's desk.

At such time as the bill becomes law, we will examine the resource requirements for its implementation.

Mr. **Yates**. Well, we'll just have to wait, then, won't we? Have you made any recommendations to the President as to whether he should sign it or not?

Mr. **Evered**. I personally have not. I have not been asked.

Mr. **Yates**. Well, that is a mistake on his part.

Mr. **Evered**. Thank you, Mr. Chairman.

Mr. **Yates**. It won't be the first one he makes. DOE wants to veto it?

Mr. **Evered**. I beg your pardon?

Mr. **Yates**. Has the Secretary recommended vetoing it?

Mr. **Evered**. Yes, he has.

Mr. **Yates**. Can you tell me why?

Mr. **Evered**. It is my understanding that the Administration feels strongly that the President has sufficient authority to implement any actions which might be required, and that the proper response to a petroleum supply shortfall would be to let the marketplace perform.

Mr. **Yates**. How in the world can the market perform under emergency conditions?

Mr. **Evered**. Quite efficiently.

Mr. **Yates**. Tell me how.

Mr. **Evered**. The industry is quite efficient at distributing any commodity which is in short supply. They are much more capable of diverting supplies to areas in need than is the Government.

I think that was proven in the 1979 shortfall arising out of the Iran crisis, when many analysts and experts believe it was the Government's price and allocation controls which exacerbated and, in fact, created shortages on a regional basis.

But I would point out that it is not the responsibility of the EIA Administrator to make or recommend policy in this area.

### DISTRIBUTION OF OIL DURING EMERGENCIES

Mr. **Yates**. How do you determine priorities for distribution of the short supplies, by executive order?

Mr. **Evered**. How do I?

Mr. **Yates**. No. How would you propose distribution in an emergency. For example, if we are cut off from Saudi Arabia for a while; how would you propose to make the distribution?

Mr. **Evered**. I wouldn't propose. It is my understanding that the Assistant Secretary for Emergency Preparedness in the Department of Energy would recommend that the industries establish the distributions necessary.

Mr. **Yates**. That the industry wants.

Mr. **Evered**. Yes. That the industry finds to be in the interest of their customers. Where the demand is, product will go.

Mr. **Yates**. Is there no national interest in that?

Mr. **Evered**. There is a national interest in the industry performing——

Mr. **Yates**. No. Is there no national interest in a distribution to others than those who the industry thinks should have it?

Mr. **Evered**. There may possibly be. There are precedents in that area. You are talking about allocation controls which this Administration has apparently rejected.

But again, I would caution, I do not speak for the Administration in this area.

### FERC DATA COLLECTIONS

Mr. **Yates**. What, if any, data collection does FERC carry out for itself?

Mr. **Evered**. None, to my knowledge.

Mr. **Yates**. You collect the information for the Commission?

Mr. **Evered**. Yes, sir.

### CONSOLIDATION OF EIA FORMS

Mr. **Yates**. Last summer, you proposed a "superform" to consolidate 17 EIA data collection forms into one. Is that "superform" completed yet?

Mr. **Evered**. The superform was published in the Federal Register for comment, and I am pleased to say that we received substantial comment on the form.

Based on the input from data users and data respondents, we elected to redesign the form and are in the process of so doing. We are collecting substantial public comment on that redesign.

We plan to hold a public hearing following publication of the revised form in the Federal Register and to implement a consolidated petroleum products sales survey by the end of this year.

Mr. **Yates**. You will have the form by the end of this year?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Will that have any budgetary impact?

Mr. **Evered**. It is planned in our fiscal year 1983 budget.

Mr. **Yates**. Will it have any impact in reducing any of your budget?

Mr. **Evered**. In the consolidation from the current petroleum products surveys, yes.

## STATE ACCESS TO EIA DATA

Mr. **Yates**. What uses did the public and States make of the satellite computer?

Mr. **Evered**. None. It was not fully implemented for their use before we discontinued it.

Mr. **Yates**. What was the extent of State access to automated public use data?

Mr. **Evered**. We provide computer tapes for use by data users. We do not provide to non-DOE entities access to our central computer files.

The Department of Energy program offices and essential contractors do have access for use of the data. Other organizations do not.

It was the intent for the satellite computer to set up a redundant data file for direct access by users, but it was judged to be too expensive to justify.

Mr. **Yates**. Do you think it would be valuable?

Mr. **Evered**. I think it would be valuable if we had the funds to support it. However, it is not the top priority of those programs which we have elected to discontinue.

## EIA PROGRAM PRIORITIES

Mr. **Yates**. Which is the top priority of the programs you have elected to discontinue?

Mr. **Evered**. I couldn't say. I would be happy to provide that for the record.

Mr. **Yates**. Okay. Would you put a list of your priorities on a scale of 1 to 10, and the cost of each of them, into the record?

Mr. **Evered**. I would be happy to. Let me clarify my understanding. You want me to prioritize the programs which we have elected to discontinue for fiscal year 1983, and their——

Mr. **Yates**. I would hate to accept your word "prioritize" because I don't like the word. Place in priority order.

Mr. **Evered**. I understand.

Mr. **Yates**. I don't like "finalize", either.

Mr. **Evered**. Make final.

Mr. **Yates**. All right.

Mr. **Evered**. I promise not to parameterize it.

Mr. **Yates**. Okay, the "ize" have it.

Your own phrase a few minutes ago was, as I understood you, that this was not your highest priority of those items that are being discontinued. I assume from that that you did have a priority list.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. And the costs of each of them?

Mr. **Evered**. I would be happy to provide that.

Mr. **Yates**. And also whether you had asked OMB for funding that list of priorities. Can I assume that your list of priorities was submitted to OMB?

Mr. **Evered**. Not necessarily. Many of these programs I, on my own, proposed to discontinue. It is not strictly a matter of OMB's directing me to discontinue them.

Mr. **Yates**. Why, if you proposed to discontinue it yourself, why would it be on your list of priorities?

Mr. **Evered**. Perhaps that is the wrong word.

Mr. **Yates**. Which is the wrong word?

Mr. **Evered**. Priority. Priority assumes desirability.

Mr. **Yates**. You and I are discussing a list of programs.

Mr. **Evered**. Programs which have been conducted in the past.

Mr. **Yates**. Okay, programs which have been conducted in the past, and to which I thought you had ascribed some element of importance.

Mr. **Evered**. The organization had.

Mr. **Yates**. Oh, not you?

Mr. **Evered**. Not necessarily me.

Mr. **Yates**. But here I am talking to you. You are the Administrator. I don't care about the organization. I don't think that is important at this point. You have the responsibility.

Mr. **Evered**. That's correct.

Mr. **Yates**. All right. And the question that I really was asking you was whether or not there are programs which you consider to be important that are not included in your request of this committee.

Programs which you consider to have importance and relevence. If there are none, tell me that.

Mr. **Evered**. There are some, Mr. Chairman.

Mr. **Yates**. Okay. If there are some, I want to know, if you can tell us what they are in order of importance and what their costs are.

Mr. **Evered**. I would be happy to provide that for the record. I would further clarify that, Mr. Chairman, by saying that there are some which, in an absolute sense, are meritorious and are desirable to conduct. However, given the need to reduce spending——

Mr. **Yates**. No, we are not talking about those. We are not talking about those.

Mr. **Evered**. What are we talking about?

Mr. **Yates**. We are talking about important programs. We are not talking about programs that have some merit. We are talking about important programs.

Mr. **Evered**. Mr. Chairman, there is nothing which I have proposed to discontinue which is more important than those programs which I plan to continue.

Mr. **Yates**. Yes. Obviously. Because the programs you plan to continue are in your budget.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Were there some that were stricken out by OMB, or were there none that were stricken out by OMB?

Mr. **Evered**. Through the collective judgment of those at many levels in the Administration, there are some programs which have not survived the process of natural selection in the budget.

Mr. **Yates**. Let's not be Darwinian about this.

Mr. **Evered**. Mr. Chairman, I think I understand the thrust of your inquiry and we would be happy to provide that information for the record.

Mr. **Yates**. Yours would be a most unique Agency if, in the course of the strainer process that programs go through as the budget is finally completed, programs were not able to get through

Agencies, Bureaus, Departments, up to OMB and have OMB strike out some of them.

What I am talking about are programs that cleared the Department of Energy, but were stricken out by OMB.

I assume those are your important programs.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Okay.

Mr. **Evered**. Those are the ones I will provide.

Mr. **Yates**. Okay.

[The information follows:]

PRIORITY LIST OF EIA PROGRAMS ELIMINATED BY OMB

[Dollars in thousands]

| Program | Priority | Amount |
|---|---|---|
| 1983 DOE request to OMB | | $66,552 |
| Mid- and long-term analysis (includes computer support) | 1 | −5,500 |
| Reduction in validation and quality assessment review of data and models, etc. | 2 | −1,956 |
| Reductions for analytical response and efficiency improvements | 3 | −2,766 |
| Reduction in scope and frequency of consumption surveys | 4 | −1,576 |
| Reduction in energy emergency management information program to standby capability | 5 | −1,048 |
| Elimination of selected low utilization data services and refinements to systems and models | 6 | −2,757 |
| Reduction in editorial preparation and disemination for a reduced number of publications | 7 | −403 |
| Reduction in computer support for priorities 2–7 | | −3,346 |
| Servance pay for 169 employees (added by OMB) | | +1,300 |
| Support for FERC[1] | | +6,000 |
| Total | | 54,500 |

[1] OMB directed EIA to support basic FERC information requirements. Most of the funds for this support were planned for on a reimbursable basis in the $66.6 million request.

## QUALITY ASSURANCE ACTIVITIES

Mr. **Yates**. Okay.

Now, you and I a few minutes ago agreed that one of your prime considerations, perhaps your prime consideration, is the quality of the information that emanates from your office.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. You said that was of greatest importance to you.

Mr. **Evered**. Yes, sir.

Mr. **Yates**. All right. Now you are proposing to spend about 1 percent of your 1983 budget request on maintaining the quality of energy information.

Mr. **Evered**. I am proposing to designate that funding for the separate quality assurance organizational unit. There will continue to be substantial quality control activity in the program areas of EIA in the collection, processing, analysis and dissemination of information.

It is a bit misleading. That funding level is not that which represents the entire quality assurance, quality control effort in EIA.

Mr. **Yates**. On page 120 of your justification, your explanation for eliminating $2,088,000. You say, "Reductions in validations and quality assessment reviews of data and models." Does that bear on quality?

**Mr. EVERED.** It does bear on quality. It will not diminish quality. Validations are reports which, in the past, were conducted to review specific data gathering systems or analytical models.

We have largely completed the bulk of those and identified those areas of weakness, and we are pursuing improvements as best we can.

We will continue to document and validate our data systems and analytical models in the future, those that we use. It does not require any greater resource level——

**Mr. YATES.** On page 121 you say, "The 1983 request for Statistical Standards is $600,000, a reduction of $2,088,000 from the 1982 appropriation.

"These activities are particularly important to achieving the objectives of minimizing the reporting burden on the public . . ."

At the start of the hearing, you indicated you wanted to avoid a reporting burden and maintain the quality of energy information.

That is your prime objective, maintaining the quality of energy information. Facilitating access to and the use of complex data bases and improving the efficiency and effectiveness of the technical aspects of statistical data production.

If ever there was a statement in a justification which pleaded for a congressional committee to overturn a recommendation, that is it, isn't it?

**Mr. EVERED.** Mr. Chairman, the supporting text describes what is being conducted or will be conducted at the $600,000 level. At the $2.7 million level, there were systems under development which required considerable investment.

They are now complete, or will be completed by the end of this fiscal year.

In addition, that is the organizational area which has largely supported the statistical needs of other departmental components. It is clear to us that their needs for such support will be greatly diminished in fiscal year 1983.

**Mr. YATES.** How is the Statistical Standards Program carried out? Contract, or in-house?

**Mr. EVERED.** A Combination of the two. Management oversight and decisionmaking, program direction and the exercise of judgment are all handled in-house.

We do use some contract support through national laboratories in providing specific technical expertise.

**Mr. YATES.** How much of a contract do you let for that? Can you give us the amount?

**Mr. EVERED.** I would be happy to provide it for the record.

**Mr. YATES.** Your staff doesn't have it in hand?

**Mr. EVERED.** I am advised that the $600,000 referred to is the contract amount, and that program direction and personnel in-house would be in addition to that.

**Mr. YATES.** The $600,000 is in-house. If that is all that is available, then you don't have any oversight, do you. Presumably your oversight——

**Mr. EVERED.** The $600,000 does not include in-house personnel. Seventeen people are slotted for the continuation of that activity.

**Mr. YATES.** Under program direction?

**Mr. EVERED.** Approximately $800,000, Mr. Chairman, for——

Mr. **Yates**. For the whole program of which $600,000 is the contract?

Mr. **Evered**. No, sir. $800,000 in addition to the $600,000.

Mr. **Yates**. Oh. That is represented, the $800,000 is for in-house personnel?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. I see. The $600,000 is the contract?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Okay.

Mr. **Evered**. I would state for the record that quality control and statistical integrity are a very high priority for me personally.

Mr. **Yates**. I would think it would be. I would think if I were in your shoes, I would hate like the devil to have $2 million stricken out.

Mr. **Evered**. It is a bit misleading in that quality control responsibility, in my opinion, is the primary responsibility of the line manager who gathers, processes and disseminates the data.

### STAFF FOR QUALITY ASSURANCE ACTIVITIES

Mr. **Yates**. With reference to the 17 people, is that the number of people you have in 1982, or is this the reduced number for 1983?

Mr. **Evered**. The reduced number for 1983.

Mr. **Yates**. How many do you have in 1982?

Mr. **Evered**. Forty-three, many of whom will be reassigned to the program areas which conduct the data collections. So that the 43 to 17 is not a net reduction of individuals responsible and active in quality control. It is simply those assigned to that program unit. Responsibility will be distributed——

Mr. **Yates**. I am not sure I understand that. You have 43 people reviewing, or overseeing a $600,000 contract?

Mr. **Evered**. No, sir.

Mr. **Yates**. What do the 43 people do? We found a few minutes ago——

Mr. **Evered**. They oversee $2.7 million.

Mr. **Yates**. Right. A few minutes ago you said there were 17 people overseeing this contract, right?

Mr. **Evered**. That's correct.

Mr. **Yates**. All right. Now I ask you, how many will there be for 1983?

Mr. **Evered**. They do substantial primary work themselves. It is not simply overseeing contracts. The 43 people should be compared to the $2.7 million funding level for 1982. Seventeen people are related to the $600,000, but they have substantial primary responsibility for activities in addition to overseeing contractors who work in support of them.

Mr. **Yates**. Okay. How does the committee get a separate identification of what can only be described as one of your important functions?

Statistical standards is the function.

Mr. **Evered**. Statistical standards is the function related to the discrete program unit which corresponds to this decision unit in the budget submission.

Mr. **Yates**. Yes.

**Mr. Evered.** As a manager, I have assigned authority and accountability for quality control to each of my major Office Directors.

**Mr. Yates.** Right. Okay.

**Mr. Evered.** They will conduct quality control activities themselves which have not been carved out as a separate budget item within each office.

**Mr. Yates.** All right. How many do you have reviewing that for statistical standards?

**Mr. Evered.** For 1983?

**Mr. Yates.** Yes, 1983.

**Mr. Evered.** I do not have separate numbers of personnel assigned solely to that because we have not yet established our staffing plan for fiscal year 1983.

**Mr. Yates.** I thought you had answered that previously by saying 17.

**Mr. Evered.** Seventeen is what remains in the separate office.

**Mr. Yates.** What does that mean? You have 43——

**Mr. Evered.** Forty-three people in a separate office now.

**Mr. Yates.** They are over here in this office.

**Mr. Evered.** They are over here. In going to 1983, responsibility for quality control will be further delegated and distributed across the other offices.

This 43 number will go down to 17. Then the overall——

**Mr. Yates.** The office that goes down to 17 is statistical standards?

**Mr. Evered.** Yes, sir.

**Mr. Yates.** All right.

**Mr. Evered.** But the responsibility for quality control and statistical integrity will remain unreduced throughout the organization, but distributed among the offices.

### STATE LIAISON ACTIVITIES

**Mr. Yates.** What information liaison with States are you maintaining in fiscal year 1982?

**Mr. Evered.** In 1982, we are conducting substantial liaison with the States in the development of our consolidated petroleum products sales survey, and in defining data needs that the States have which we can assist them with.

In addition, we are looking for areas in which the States can make our data gathering job easier.

**Mr. Yates.** But you are not going to do that, you are not going to have that activity in 1983?

**Mr. Evered.** We will continue to have activities and relationships with the States. The budget refers to a discrete State liaison activity or office which I will discontinue separate funding for.

It will be a function which will continue, but not as a separate organizational entity.

**Mr. Yates.** This is another burden added to the existing employees, right?

**Mr. Evered.** Not a burden.

**Mr. Yates.** A blessing.

**Mr. Evered.** Yes, sir. An opportunity.

Mr. **Yates**. A challenge. That is a better word, isn't it?

Mr. **Evered**. Challenge is a better word.

Mr. **Yates**. In the process of streamlining it. What do the States lose as a result of termination of this activity?

Didn't you say the States will not lose this activity. The office is being discontinued, but the activity will go on.

How will you centralize the activity? Who will be in charge? Who will you turn to in order to find out whether this activity is being carried on with the States?

Mr. **Evered**. Its conduct is largely required only on a fuel-specific basis. Say in the area of the petroleum products survey, the Office Director for Oil and Gas would have the responsibility for overseeing that.

Mr. **Yates**. So the responsibility moves to the Director of Oil and Gas?

Mr. **Evered**. The responsibility is distributed among the Office Directors for relationships with the States relative to their specific areas of responsibility. It does not require a central coordinated State liaison office to conduct the program efficiently.

Mr. **Yates**. That assumes that you can categorize it that precisely, doesn't it?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Can you?

Mr. **Evered**. Yes, sir.

Mr. **Yates**. Really?

Mr. **Evered**. Yes, sir.

### SUBSCRIPTIONS TO MONTHLY ENERGY REVIEW

Mr. **Yates**. More power to you. How many subscriptions are there to the *Monthly Energy Review?*

Mr. **Evered**. 5,000.

Mr. **Yates**. What is the annual cost of the subscription?

Mr. **Evered**. It is available from the Government Printing Office——

Mr. **Yates**. At a price of.

Mr. **Evered**. At a price of—I never ordered one. Just a moment.

Mr. **Yates**. Isn't it very interesting?

Mr. **Evered**. Annual subscription in the U.S. is $28 a year.

Mr. **Yates**. Who subscribes to it other than the staff of the committee?

Mr. **Evered**. The staff is provided free copies, as are all Members of the Congress, sir.

Mr. **Yates**. Yes.

Mr. **Evered**. Subscribers to the *Monthly Energy Review* are a broad cross-section of industry, Government, academia, every segment of society interested in energy.

It is one of our basic statistical periodicals.

### NATIONAL ENERGY INFORMATION CENTER

Mr. **Yates**. We turn to page 122 of your justification, Anticipated Workload, Energy Information Center.

Under Inquiries Handled, you show 60,000 in 1981; 75,000 in 1982; and 70,000 in 1983. Does the reduction from 1982 to 1983 mean that you won't have more inquiries, or that you won't be able to handle as many?

Mr. EVERED. Mr. Chairman, I haven't the faintest notion.

Mr. YATES. That is an honest response. How do I get an answer?

Mr. EVERED. It could be reasonably assumed that the public——

Mr. YATES. Who prepared those statistics?

Mr. EVERED. The ubiquitous staff. I suspect there will be——

Mr. YATES. Are they being spread out, too?

Mr. EVERED. I beg your pardon.

Mr. YATES. Is the ubiquitous staff being spread out, too?

Mr. EVERED. Yes, sir, they are being spread in that area between 1982 and 1983. There will be fewer staff available to handle inquires. I think it is reasonable to assume that the traffic level will stabilize and not continue to increase.

Mr. YATES. Will stabilize? But your justification says it will go down from 75,000 to 70,000.

Mr. EVERED. I think within the range of assumptions, that is largely stable.

Mr. YATES. That is a discrete answer. What does this mean to the public, anybody who wants to get an answer to an inquiry?

Mr. EVERED. Mr. Chairman, the National Energy Information Center is one of the most responsive public inquiry organizations in the Federal Government.

Mr. YATES. Okay. How many people do you have assigned there for fiscal year 1982?

Mr. EVERED. 28.

Mr. YATES. How many will you have in 1983?

Mr. EVERED. 21.

Mr. YATES. All right.

Mr. EVERED. Not all of them directly handle inquiries. For fewer than 28 actually staff the telephone banks and correspondence systems.

Mr. YATES. How do I get precise answers, then? If I ask you how many are handling it and you tell me 28, then you say not all are handling the telephone banks. How many are handling the telephone banks?

Mr. EVERED. I would be happy to provide that for the record. The National Energy Information Center has responsibilities in addition to simply handling the inquiries coming in.

Mr. YATES. Such as what?

Mr. EVERED. They provide publications preparation support to the rest of the EIA, as well as other communications services.

[The information follows:]

### PERSONS RESPONDING TO PUBLIC INQUIRIES

EIA devotes about 9 full-time in-house staff to responding to inquiries from the public. In addition, 14 full-time staff of the University of New Mexico under contract to DOE provide assistance in this function of disseminating energy information to the public.

## FEES CHARGED BY EIA

Mr. YATES. Do you charge any fees.

Mr. EVERED. We charge for publications subscriptions through GPO and NTIS. We do not do work for business which we might charge for.

Mr. YATES. What is the nature of the amount of the fee you charge?

Mr. EVERED. The publications prices?

Mr. YATES. Put it in the record.

Mr. EVERED. I would be happy to.

Mr. YATES. All right.

Mr. EVERED. It is based on a cost-recovery mechanism.

[The information follows:]

### PRICES OF EIA PUBLICATIONS

A list of publications and their prices has been provided for the committee files. These publications range in price from $1.00 for a single report to $45.00 for an annual subscription to a monthly publication. The list contains 646 separate publications including annual volumes of recurring publications.

## BUDGET REQUEST FOR POLICY AND MANAGEMENT

Mr. YATES. Yes.

Now you are requesting an increase in policy and management from $1,833,000 to $2,445,000. Why?

Mr. EVERED. Mr. Chairman, in the supporting detail on that page, you will note that $1.3 million of that is severance pay for the entire organization.

Mr. YATES. Yes.

Mr. EVERED. That assumes a reduction-in-force action releasing 169 employees, which I am confident will not be necessary.

Mr. YATES. How much severance pay have you budgeted for in 1982?

Mr. EVERED. None.

Mr. YATES. How come?

Mr. EVERED. Just a moment. I stand corrected, Mr. Chairman. About $300,000.

Mr. YATES. How accurate is that figure?

Mr. EVERED. It is based on current payroll estimates, Mr. Chairman. We did involuntarily separate a number of employees at the conclusion of fiscal year 1981, and of course, we are currently covering their severance pay.

## EIA CONSULTANTS AND CONTRACTORS

Mr. YATES. Do you have consultants that you give contracts to?

Mr. EVERED. We have consultants and contractors. We have a very few consultants; that is a separate kind of procurement category.

Mr. YATES. Would you place in the record a list of the consultants and contractors, please?

Mr. EVERED. I will be happy to. It will be a short list of consultants.

[The information follows:]

### EIA CONSULTANTS AND CONTRACTORS

The following individuals currently serve as consultants under contract to EIA:

Anthony E. Bopp
J. Philip Childress
Carl E. Harris
George M. Lady
Benjamin Lev
John S. Maybee
Nathaniel Ng
Carlisle Moody

The following is a list of current EIA Contractors:

Alanthus Data Communications
American Statistical Association
Anderson-Jacobson, Inc.
Applied Management Science
Argonne National Lab
Boole & Babbage, Inc.
Bonner & Moore
Brookhaven National Lab
CACI, Inc.
Cambridge Computer Assoc.
Cambridge Systems Group
CAPEX Corporation
Cexec, Inc.
Colorado Nuclear Corp.
Computer Data Systems
Continental Peripherals Contral Data Corp.
Coopers & Lybrand
Courier Terminal Systems
Data Access Systems
Data Resources, Inc.
EDS Federal Corp.
Energy & Envir. Analysis, Inc.
Foster Associates, Inc.
Four Phase Systems, Inc.
G.P. Technology Corp.
Guide International Corp.
Harris Data Communications
Haverly Systems
Information Systems & Network
Innovation Data Processing
Integrated Software Systems
Intel Corporation
Interactive Data Corp. International Business Machines Corp.
JWK International
Ketron, Inc.
Kilkeary, Scott & Associates
Labat-Anderson
Lawrence Livermore National Lab
Los Alamos Scientific Lab
Lundberg Survey, Inc.
Management Engineers
Massachusetts Inst. of Technology
Mathtech, Inc.
Maxima Corp.
NCR Comten
University of New Mexico
Northern Telecom, Inc.
Nuclear Assurance Corp.
Oak Ridge National Lab.
One America, Inc.
University of Oklahoma
Orkand Corp.
Pansophic Systems
Power Technologies
Raven Systems
Response Analysis Corp.
J.A. Reyes Associates
SAS Institute, Inc.
SPSS, Inc.
Schrager, Klemens & Krueger
Science Management Corp.
Scientific Systems, Inc.
Social & Scientific Systems
Software Ag, Inc.
Softwares, Inc.
Speakeasy Computing Corp.
Standard & Poors
Stanford University
Steiner Financial
Sterling Systems, Inc.
Storage Technology
Systems & Applied Sciences
Terminals Unlimited, Inc.
Textronix, Inc.
Uni-Coll Corp.
United Computing Systems
University Computing Co.
Vanguard Technologies Corp.
Watson, Rice & Co.
Westat, Inc.
Westinghouse Electric Corp.
Wharton EFA, Inc.

## AVAILABILITY OF FUNDS

Mr. **Yates**. That is good. Let's turn to page 109 for a second. You want a change in the appropriations language. Why do you want the funding to remain available until it is spent? It is subject to a point of order.

Mr. **Evered**. A point of order on the floor?

Mr. **Yates**. Yes.

Mr. **Evered**. The intent there is to provide the opportunity to expend the funds at a schedule warranted by the workload, rather than being forced to obligate the funds before the end of the fiscal year.

Mr. **Yates**. I think every Agency would love that. But unfortunately, they have got to face up to the end of the fiscal year as the cutoff point.

### EIA PRINTING COSTS

You have got a big reduction in printing costs coming up. Is there a reason for that?

Mr. **Evered**. Two reasons. First we over-estimated our printing costs for 1982. And second, we are going to put out fewer documents.

Mr. **Yates**. How much of your printing costs are recovered through paid subscriptions?

Mr. **Evered**. None directly. We do not recoup funds. They go directly to the Treasury.

Mr. **Yates**. Are there any offsets to your collections?

Mr. **Evered**. No.

Mr. **Yates**. Do you help the Department of Transportation in its publication of a monthly gasoline report by State?

Mr. **Evered**. Not to my knowledge. Their publication?

Mr. **Yates**. Their publication.

Mr. **Evered**. We consult with them in identifying problems in motor gasoline consumption statistics, but I am not aware of direct support to them in that effort.

Mr. **Yates**. All right. We are going to have a series of questions that we will ask you to reply to for the record.

Mr. **Evered**. All right.

[The questions and answers follow:]

## ADDITIONAL COMMITTEE QUESTIONS

### Budgeting for Other Organization Information Needs

Question: Wildavsky in his book states that "one way to make EIA more relevant is for the users of EIA data to budget for their information needs in their own request." His theory is that if these user agencies have to justify their information needs in their own budgets, they will be more careful in what they need. What are your thoughts on whether this is a good idea or not?

Answer: In theory, the requirement that other Department of Energy (DOE) organizations budget for their own information needs is a good one. In fact, the Energy Information Administration (EIA) has announced to its users that requests which require special services, such as a specialized data collection or a modification to a data processing system, can only be met with a transfer of funds from the requesting office. However, requests for information which can be met with existing capabilities will continue to be routinely satisfied. Historically, EIA has worked closely with DOE organizations to assure that essential programmatic energy information needs are met in a cost effective manner and with a minimum of public reporting burden. As a result, many of the EIA information programs have been designed with the capability to satisfy multiple purposes, including both general statistical reporting and specific program needs. An exception is that EIA will continue to budget for the basic information support requirements of the Federal Energy Regulatory Commission.

Question: Could you give us an idea of what the relative advantages and disadvantages of this proposal might be?

Answer: The advantages have been stated. Essentially, the elimination of a "free" resource leads to careful planning and conservation of resources. The disadvantage would be that other organizations might find themselves resource constrained in some years, and with greater flexibility to "purchase" information services in other years. This would make it more difficult for EIA to plan computer capacity and utilization properly.

### EIA Forecasts

Question: The workload table for collection, production and analysis on page 119 indicates that although you are eliminating mid- and long-term forecasts, you still have a number of forecasts projected to be completed for FY 1983.

--Please explain to the Committee what forecasts you will continue.

Answer: EIA will continue short-term forecasts, extending the short-term to five - seven years. The workload numbers refer to the number of short-term forecasts that will be prepared. These include those for the Short-Term Energy Outlook, which is published quarterly, and those for other special analyses, such as natural gas decontrol analysis.

## Data Collection Activities

Question: According to the budget justification (p. 127) during 1982 EIA will assume data collection activities from the rest of DOE. What are these data collection activities that you will assume in 1982?

Answer: During Fiscal Year 1982 EIA has assumed data collection responsibilities for these forms:

| | |
|---|---|
| EIA-254 | Quarterly Progress Report on Status of Reactor Construction |
| EIA-491 | Survey of United States Uranium Marketing Activities |
| EIA-717 | Annual Uranium Exploration Survey |

Question: Why are you assuming all of these activities?

Answer: These data collection activities were performed by the predecessor organization to the Office of the Assistant Secretary for Nuclear Energy. When the Department of Energy was formed, the authorizing legislation gave EIA the authority to perform all data collection functions and to redelegate this authority to other organizations as appropriate. EIA's approach to this has been to examine the redelegation issue as each form comes up for renewal. During this process it was decided that the three forms in question were within the scope of EIA's mission of gathering energy information. Therefore, EIA assumed the data collection responsibility when the forms were renewed by OMB, in the beginning of Fiscal Year 1982.

## Emergency Preparedness

Question: The budget justification (p. 138) indicates that the Energy Emergency Management Information System will no longer be maintained as a separate system. However, basic information programs needed for monitoring energy trends for emergency preparedness will continue. Please describe for us what there basic information programs are.

Answer: In a broad sense, almost all of the EIA information collection and analysis programs can be considered as contributing to the Nation's emergency preparedness posture. EIA's energy emergency information program consists of several discrete activities that provide information useful for monitoring energy trends in a potential emergency situation. First is a capability to provide a blueprint for information responses to various types of supply interruptions. It will facilitate use of existing EIA data and analysis programs for information relevant to the specific emergency situation, and will include computer assisted telephone interviewing to obtain responses to surveys more rapidly and an automated communications network called DIALCOM to facilitate information exchange with State Energy Offices.

A second activity is the Weekly Petroleum Reporting System, from which the Weekly Petroleum Status Report is produced. The Weekly informs a wide audience of the current petroleum supplies, stocks, and inventories. The Weekly is highly regarded by its clientele and has resulted in a marked decrease in ad hoc requests for current supply information, has ensured consistency in EIA supply information provided to the public, and has acted as a deterrent to undue reaction to isolated supply problems.

Other EIA activities relevant to emergency preparedness include the Short-Term Energy Outlook, the Coal Strike Monitoring System, natural gas curtailments information, and information for the International Energy Agency.

## Emergency Information Needs

Question: Having adequate energy information available in an emergency situation is of interest to the Committee.

--What information do you think is necessary for EIA to maintain in order to best serve the nation's interests?

Answer: Information needs for an energy emergency would, of course, be dependent upon the type of emergency. However, past experience indicates that energy decisionmakers require more timely, more detailed basic information, rather than the creation of new data series. The EIA produces weekly petroleum supply information in its Weekly Petroleum Status Report. If needed, detailed weekly data on either coal or natural gas supplies could be gathered using forms which are in standby status and special data processing techniques. Additionally, analytical resources can be shifted as necessary to focus on energy emergency issues.

## Emergency Prepardness Funds

Question: What budgetary resources have been identified for emergency preparedness in FY 1982 and FY 1983?

Answer: The two major EIA activities which support emergency preparedness are the Weekly Petroleum Reporting System and EIA's program to speed access to existing data and analyses, provide quick collection capability, and enable rapid communications to occur. The costs for these programs are $2.1 million in FY 1982 and are estimated at $1.3 million in FY 1983.

## Natural Gas Requirements

Question: The 1981 annual report states that "EIA will be closely monitoring the natural gas marketplace to insure that the decisionmakers are adequately provided with the information needed to make essential decisions."

-- What resources are devoted to this effort in FY 1982 and what do you propose for FY 1983?

-- How does this compare to what you have done in 1981?

Answer: The Natural Gas Division of the Office of Oil and Gas is the principal EIA organization charged with this mission. Its FY-82 and projected FY-83 budgets are summarized below.

| | Staff (Full Time Equivalent) | Contract Dollars ($000's) |
|---|---|---|
| 1982 | 48 | $4,753 |
| 1983 | 48 | $4,053 |

In addition to the work of the Natural Gas Division, the work of several other EIA organizations is integral to our overall understanding of natural gas industry operations. The Natural Gas Division seeks to place all of these activities into a common focus. A listing of some of the activities of other organizations follows:

- o Other Office of Oil and Gas Divisions
  - Develop estimates of proved reserves of natural gas and natural gas liquids.
  - Collect and publish data on natural gas plant operations and the distribution of liquefied petroleum gases.
- o Office of Energy Markets and End-Use
  - Collects residential natural gas consumption data.
  - Develops short-term forecasts of natural gas supply and demand with Natural Gas Division input.
  - Publishes reports covering multiple energy resources, such as the Monthly Energy Review and the quarterly Short-Term Energy Outlook.
- o Office of Coal, Nuclear, Electric, and Alternate Fuels
  - Collects and publishes data on natural gas consumption by electric utilities.
  - Develops natural gas demand forecasts relative to electric utilities and multi-fuel boilers.

The EIA FY-81 natural gas program was substantially different than that for FY-82. The EIA reorganization in July 1981 sought to bring the majority of gas operations into a single entity by establishing the Natural Gas Division. Prior to that time, operations were widely fragmented.

The FY 1982 program is far more focused than the program in FY 1981, when resources currently in the Natural Gas Division were assigned to four separate organizational units within EIA. While the reorganization resulted in more focused attention to natural gas issues and activities, resources have remained constant.

## Energy Information Amendments of 1981

Question: In May 1981 you submitted proposed legislation, the "Energy Information Amendments of 1981" (S. 1281), to eliminate or alter some legislative requirements which have resulted in burdensome detailed data collection. Could you provide the Committee with an update on the status of this legislation.

Answer: The DOE submitted the proposed bill, "Energy Information Administration Amendments of 1981," on May 1, 1981. It was introduced in the Senate as S. 1281 by Senator McClure and referred to the Committee on Energy and Natural Resources on May 21, 1981. The proposed bill was also introduced in the House as H.R. 5923 by Congressman Collins and referred to the Committee on Energy and Commerce on March 23, 1982.

## Impact of S. 1281 on Budget Request

Question: If this legislation (S. 1281) is not enacted what is the impact on your budget request for FY 1983?

Answer: The EIA FY 1983 budget is based on the assumption that S. 1281 will be approved, and that additional legislation to remove the requirements for mid- and long-term forecasting will also be enacted. If it appears that passage of these measures is unlikely, EIA would have to reassess the scope and potential alternate means for satisfying the requirements. Consideration would be given to shifting resources from other ongoing activities, and it is possible that EIA would find it necessary to request additional resources, both in staff and funds. EIA intends to carry out the provisions of legislation governing its activities to the extent possible with the available resources.

## Copy of Energy Information Administration Amendments of 1981

Question: Provide for the record a copy of the Energy Information Administration Amendments of 1981.

Answer: A copy of the requested proposed legislation is attached.

II

97TH CONGRESS
1ST SESSION

# S. 1281

To reduce costs and the public reporting burden and increase the efficiency of the Energy Information Administration.

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IN THE SENATE OF THE UNITED STATES

MAY 21 (legislative day, APRIL 27), 1981

Mr. MCCLURE (by request) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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# A BILL

To reduce costs and the public reporting burden and increase the efficiency of the Energy Information Administration.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the "Energy Information Administration Amendments of 1981".

SEC. 2. Section 58 of the Federal Energy Administration Act of 1974 (15 U.S.C. 790g) is amended by—

(a) amending subsection (a)(2) to read as follows:

"(2) the disclosure of which by the Director under sections 205(f) and 407 of the Department of Energy

Organization Act would, as determined by the agency head, impair significantly the discharge of authorities and responsibilities that have been delegated to, or vested by law, in the agency.";

(b) redesignating subsection (b) as subsection (c); and

(c) adding a new subsection (b) as follows:

"(b) The Director, on behalf of the Administrator, may provide the head of a Federal agency from which energy information is sought under subsection (a) of this section with a binding assurance that energy information received from that agency will not be disclosed to another administration, commission, or office of the Department of Energy as required by sections 205(f) and 407 of the Department of Energy Organization Act if the head of the agency from which the information is sought advises the Director that a determination has been made under subsection (a)(2) of this section and that the information will not be provided without a binding assurance of nondisclosure. Any statutory restrictions on or penalties for the disclosure of energy information received under this section shall apply to the Administration to the same extent as to the agency from which the energy information was received.".

SEC. 3. Section 407 of the Department of Energy Organization Act (42 U.S.C. 7177) is amended by striking the period at the end of subsection (a) and inserting in its place ", except that the Administrator of the Energy Information Administration is not required to disclose to the Commission any energy information that was (1) obtained under a binding assurance of nondisclosure as provided for in section 58(b) of the Federal Energy Administration Act of 1974 or (2) gathered for statistical purposes under section 205(i).".

SEC. 4. Section 205 of the Department of Energy Organization Act (42 U.S.C. 7135) is amended by—

(a) striking the period at the end of subsection (f) and inserting in its place: ", except that the Administrator is not required to disclose to such administration, commission or office any energy information that was (1) obtained under a binding assurance of nondisclosure as provided for in section 58(b) of the Federal Energy Administration Act of 1974 or (2) gathered for statistical purposes under subsection (i) of this section."; and

(b) inserting after subsection (h) the following new subsection (i):

"(i)(1) The Administrator, before starting a data collection effort, shall determine whether the information is to be gathered for statistical purposes.

"(2) Data to be gathered for statistical purposes shall be made available in individually identifiable form to another office in the Department of Energy or to another Federal agency only upon receipt of a written request that contains—

"(A) a demonstration of need for the data in individually identifiable form by that office or agency for the fulfillment of its lawful duties and responsibilities, and

"(B) reasonable and binding assurances by the requesting office or agency that the information will be used solely for statistical purposes.

"(3) Notwithstanding any other law, section 11(d) of the Energy Supply and Environmental Coordination Act of 1974 applies to any information obtained by the Administrator for other than statistical purposes under any law except section 17 of the Federal Nonnuclear Research and Development Act of 1974. Both section 1905 of title 18, United States Code, and any determination of confidentiality made by the Administrator under section 11(d) of the Energy Supply and Environmental Coordination Act of 1974 apply to any disclosure of energy information by an agency to whom it was disclosed under section 11(d)(2) of the Energy Supply and Environmental Coordination Act of 1974 except that an agency head may disclose energy information received under section 11(d)(2) of the Energy Supply and Environmental Coordination Act of 1974 in any proceeding if—

"(A) the agency is a party to the proceeding;

"(B) the agency head determines that disclosure of the information in the proceeding is essential to the agency's effective participation in the proceeding; and

"(C) the agency head seeks an order in the proceeding protecting against disclosure of the information beyond that necessary to the agency's effective participation in the proceeding.

"(4) For purposes of this section, "statistical purposes" means the use of information for developing or reporting aggregate or anonymous information not intended to be used, in whole or in part, in any way in which the specific identity of any person is material to the intended use of the information,".

SEC. 5. Section 11 of the Energy Supply and Environmental Coordination Act of 1974 (15 U.S.C. 796) is amended—

(a) by striking the last sentence of subsection (a); and

(b) in subsection (c)—

(1) by striking paragraph (2);

(2) by redesignating paragraph (3) as paragraph (2);

(3) by striking "shall" appearing immediately before "require" in redesignated paragraph (2) and inserting in its place "may"; and

(4) by amending the undesignated text following redesignated paragraph (2)(B) to read as follows: "The Administrator may tabulate and publish, on an annual basis, reports based on the energy information gathered under paragraphs (2)(A) and (B) of this subsection. These reports shall present energy information in the categories specified in section 503(c) of the Energy Policy and Conservation Act to the extent that energy information may be compiled from such accounts.".

SEC. 6. Section 25 of the Federal Energy Administration Act of 1974 (15 U.S.C. 784) is repealed, and its catchline is stricken.

SEC. 7. (a) Section 205 of the Department of Energy Organization Act (42 U.S.C. 7135) is amended by striking subsection (h).

(b) Notwithstanding subsection (a), the annual report required under section 205(h) of the Department of Energy Organization Act (42 U.S.C. 7131(h)) for calendar year 1980 may be completed.

SEC. 8. (a) Section 801 of the Powerplant and Industrial Fuel Use Act of 1978 (42 U.S.C. 8481) is repealed.

(b) Section 101(b) of the Powerplant and Industrial Fuel Use Act of 1978 (42 U.S.C. 8301 note) is amended by striking the item in the table of contents relating to section 801.

SEC. 9. (a) Section 242 of the Emergency Energy Conservation Act of 1979 (42 U.S.C. 8532) is repealed.

(b) Section 1(b) of the Emergency Energy Conservation Act of 1979 (42 U.S.C. 8501 note) is amended by striking the item in the table of contents relating to section 242.

SEC. 10. This Act takes effect thirty days after enactment.

## Funds to Meet EIA Legislative Requirements

Question: What contingency plan do you have in the event that this legislation is not passed?

Answer: If S. 1281 "EIA Amendment Act" does not pass, EIA will continue to meet the information requirements contained in the various laws within the context of the resources available. If additional resources are not forthcoming, some reports may be reduced in scope and frequency. For example, EIA will continue to conduct mid- and long-term forecasting activities if legislation to exempt it from this requirement does not pass. However, these forecasts may use fewer and simpler models, resulting in fewer projections. Similar accommodations will be made with regard to the requirements of the Emergency Energy Conservation Act and other legislation from which EIA has sought relief.

EIA intends to carry out the provisions of legislation governing its activities to the extent possible within the context of the resources that are available.

## Elimination of Regulatory Oil Reporting Forms

Question: For the record, provide a list of the regulatory oil reporting forms which are no longer required as a result of the expiration of the Emergency Petroleum Allocation Act.

Answer: The following regulatory oil reporting forms were eliminated in May 1981 as a result of the expiration of the Emergency Petroleum Allocation Act:

| Form No. | Form Title |
|---|---|
| EIA-27 | Foreign Oil Supply Agreements Reports |
| EIA-169 | Prime Suppliers Three-Month Projection of Total Supplies and Stocks |
| EIA-171 | Sales of Asphalts and Road Oils |
| EIA-175B | Weekly Bulk Terminal Stocks of Residual Fuel Oils |
| EIA-403 | Useable Fuel Inventories |
| ERA-49 | Domestic Crude Oil Entitlements Program Refiners Monthly Reports |
| ERA-56 | Crude Oil Buy/Sell Program Refiner Buyer Semi-Annual Report |
| ERA-57 | Crude Oil Buy/Sell Program Refiner Seller Monthly Report |
| ERA-69 | Crude Oil Resellers Self-Reporting Form |
| ERA-93 | Tertiary Enhanced Recovery Program |
| ERA-99 | Request for Assignment of a Supplier and/or Base Period Supply Volume |
| ERA-100 | Certification of Request for Use Under Allocation Levels Not Subject to Allocation Fraction |
| ERA-102 | Application for No Action Determination |
| ERA-116 | Old Oil Entitlements Program-Entitlements |

| | |
|---|---|
| | Transaction Report |
| ERA-135 | Application to State for Petroleum Product Hardship or Emergency |
| ERA-136 | State Action on Application for Hardship or Emergency Relief |
| ERA-137 | Wholesale Producer Resellers Certification of Distribution |
| ERA-140 | Complainant's Report |
| ERA-183R | Information Requirements for the Emergency Allocation of Crude Oil |
| ERA-470 | Gasoline Conservation Fee Entitlements Production |
| ERA-471 | State Set-Aside Monthly Report |
| ERA-480 | Application for Certification of Refinery Capacity |
| FEA-P-129 | Naphtha Imports into Puerto Rico |

Since May 1981, several additional forms have been eliminated:

| Form No. | Form Title |
|---|---|
| B1156, 57, 58, 59, 60, 61 | Survey of Fuel Oil Dealers |
| EIA-175A | Bulk Terminal Stocks of No. 4 and Residual Fuel oils |
| FEA-P-314 | Monthly Survey of Distillate and Residual Fuel Oil Sales Volume to Ultimate Consumers |
| FEA-P-315 | Monthly Survey of Propane Sales Volume to Ultimate Consumers |
| ERA-424A, B, C | Report Form(s) for Enhanced Oil Recovery Incentives Program |
| ERA-160 | Monthly Electric Utility and Fuel Planning Report |
| SG-7 | Survey of Gallonage Sales of Gasoline |
| ERA-59 | Crude Oil Allocation Program Report |
| EIA-9B | No. 2 Fuel Oil Telephone Price Monitoring System |

In addition, several forms have been modified to eliminate data elements required by the Emergency Petroleum Allocation Act. They are:

| | |
|---|---|
| EIA-14 | Refiner's Monthly Cost Allocation Report |
| EIA-25 | Prime Suppliers Monthly Report |
| ERA-182 | Domestic Crude Oil First Purchase Report |
| EIA-460 | Petroleum Industry Monthly Report for Product Prices |

### Standby Petroleum Allocation Act

Question: The Congress recently passed a new standby petroleum allocation act. What responsibilities would EIA have under this act.

Answer: EIA would have had two major responsibilities. First, EIA would have collected information on the pricing, supply, and distribution of petroleum products as required by Section 284. Second, in accordance with existing law and established procedures, EIA would have provided the data collection and processing services that could be required to support the regulatory provisions of the bill.

## Support to the Federal Energy Regulatory Commission

Question: One of your customers is the Federal Energy Regulatory Commission. Could you tell the Committee how much of the collection, production, and analysis appropriation for '82 is in support of the Federal Energy Regulatory Commission and also provide the same information for your FY 1983 request.

Answer: FY 1982 support to the Federal Energy Regulatory Commission (FERC) from the collection, production, and analysis appropriation totals approximately $6 million. In addition, program and support services are provided, bringing total support to approximately $8.5 million. EIA plans to continue ongoing activities for the FERC at an estimated level of $6 million.

## FERC Validation Program

Question: According to the FY 1981 annual report to Congress (p. 6), EIA coordinates its efforts on burden reduction with the data validation program of the Federal Energy Regulatory Commission.

--Is the Federal Energy Regulatory Commission data validation program designed for its own energy collection efforts or is it designed to validate information that EIA has collected for the Commission?

--For the record, please provide the Committee the resources FERC applies to data validation both in terms of dollars and staff.

Answer: The data validation program of the Federal Energy Regulatory Commission (FERC) is designed for all FERC public use forms. EIA currently performs the data collection for many of these forms. All of the forms collected by EIA for FERC as well as those collected exclusively by the FERC are subject to the requirements of the FERC validation program. All of the forms that EIA collects under FERC sponsorship have been validated or are currently in the validation process.

EIA is unaware of the exact resources utilized by FERC in support of its data validation program. The responsibility for the FERC validation program is in the Office of the Executive Director, FERC.

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## Program Services Reduction

Question: The Program Services activity decreases from the FY 1982 appropriation level of $20,554,000 to the 1983 request of $13,162,000. Could you describe to the Committee in general terms what this reduction means?

Answer: Information Management Services will have a reduction in disk storage, number of terminals, training, and technical support to computer users as a result of information program terminations and reductions. Due to the reduced number of publications, the National

Energy Information Center will have a reduction in editorial preparation and dissemination. Reductions in Statistical Standards will be in the areas of validations and quality assessment reviews of data and models; forms clearance, statistical design, statistical procedures, and frames development. Major improvements in the quality of EIA data and analyses have been made, in part, as a result of the validation program. Therefore, this program is being reduced and responsibility shifted to the line offices. The Statistical Standards function will continue to work on burden reduction and monitor EIA's adherence to existing standards.

### Statistical Standards

Question: How much of the $600,000 request for Statistical Standards is related to validations and quality assessment reviews of data and models?

Answer: $50,000 is related to validations and quality assessment reviews of data and models. The remainder is related to frames development activities ($500,000) and maintenance of the Data Resource Directory ($50,000).

## AUTOMATION OF PUBLICATIONS

Question: The annual report indicates that you are attempting to get as many publications as you can either entirely or partially computerized and photocomposed directly from survey data files. When do you expect to have this job completed?

Answer: We expect to have the job completed by the end of FY 1983.

Question: What are the advantages of these processes?

Answer: Information is more flexible when stored electronically. Modifications, including major changes in page make-up and the integration of text, tables and graphics, are simpler and less costly to carry out when page images are drawn from electronic storage, manipulated on a screen, then reduced to camera copy. Errors are reduced because information is normally keystroked only once, upon initial entry into electronic storage. Finally, information can be published in a more timely way using automated processes than using manual ones. For example, we estimate that manual typesetting would add 35 calendar days to the publication cycle of the Electric Power Monthly, an automated consolidation of five publications. The soon-to-be-published Petroleum Supply Monthly, a consolidation of four publications that used to appear up to 120 days after the end of the month of reference, will appear 60 days after the end of the month of reference. Holding to this schedule would be impossible without automation.

Question: Will you please provide the Committee with a schedule for those you plan to do in FY 1982 and FY 1983?

Answer: EIA is undertaking a program of publications consolidation as well as one of publications automation. We will complete consolidating and automating coal and electricity publications by the end of FY 1982; we will complete consolidating and automating petroleum, natural gas, nuclear energy, renewable energy and crosscutting publications by the end of FY 1983.

## Consolidation of Publications

Question; The anticipated workload for the Program Services activity shows a drop from 3 million to 1.3 million for separate issues of publications disseminated. Is this decline a result of fewer publications or is it a result of a smaller market for EIA products?

Answer: The reduced number of separate issues of publications disseminated is due primarily to a consolidation of publications in related energy areas. For example, the Petroleum Supply Monthly, to be introduced in March 1982, replaces four separate monthly petroleum data reports. Plans are underway or have been completed for consolidated reports in each major energy area.

Question: What resources would it take to speed this process in FY 1983? Would it be cost effective?

Answer: Consolidation and automation are proceeding hand-in-hand. Consolidated publications are being automated as they are established (the Petroleum Supply Monthly is a good example). Both processes are moving rapidly, but additional resources for one would not necessarily have a cost-effective impact on the other. Therefore, we believe that resources available to EIA in FY 1982 and contained in the President's Budget for FY 1983 will be sufficient to complete both processes simultaneously.

## Inquiry Response Time

From 1981 to 1983 you expect the number of inquiries handled annually to increase from 60,000 to 70,000 per year.

Question: In what amount of time can you normally respond to an individual inquiry?

Answer: Inquiry response time varies according to mode of inquiry and the complexity of the question. For example, we normally respond on the spot to 97 percent of all walk-in inquiries. In some cases it may be necessary to obtain data from outside the National Energy Information Center. These requests can take a longer period of time to complete. Similarly, telephone inquires in most cases can be answered immediately by the telephone inquiry staff. Questions requiring extensive data or indepth research are turned over to specialists in various energy subject areas who normally respond within 1 working day. Even in those cases where detailed research cannot be carried out within the day, an interim response is given. Final responses are provided within 5 working days to nearly 97 percent of all telephone inquiries. Written inquiries frequently require detailed responses. Simple requests for publications and forms are completed within a week in over 99 percent of the cases. Approximately 45 percent of letters requesting statistical data or program information also receive responses within a week. Nearly 90 percent of data and program inquiries are answered within 10 working days.

## Inquiries by Affiliation

Question: Could you provide the Committee with information on the 60,000 inquiries you handled during 1981? Break the inquiries down by DOE requests, State government requests, local government requests, by private citizen requests, and by business requests.

Answer: During 1981 inquiries received and handled by the National Energy Information Center (NEIC) were comprised as follows:

| | Number of Requests | Percent of total |
|---|---|---|
| Department of Energy | 8,371 | 13.6 |
| Congress | 1,507 | 2.4 |
| Other Federal Government | 3,590 | 5.8 |
| State and local government | 2,701 | 4.4 |
| Private citizens | 3,212 | 5.2 |
| Business and industry | 27,443 | 44.4 |
| Other* | 14,939 | 24.2 |
| Total | 61,763 | 100.0 |

* Includes foreign governments, media, academia and libraries

As shown in the above chart business and industry is our largest client group. For recordkeeping purposes, the National Energy Information Center inquiry tracking system combines inquiries from State and local governments in one category.

## Transfer to Commerce

Question: Mr. Evered, you are quoted in the Oil Daily as saying that "EIA is not suitable for Commerce because of the mission of EIA and the limitations of Commerce." The budget, however, assumes that EIA will be part of Commerce.

--What do you see as the limitations of Commerce in relation to EIA?

Answer: I see no limitations of Commerce in relation to EIA. As the President's budget proposes, the majority of functions and programs currently carried out by the Department of Energy would be transferred to Commerce. My quote in the Oil Daily article of November 10, 1981, was in reference to the EIA transferring to Commerce alone or with only a very few energy programs.

--What is there about the EIA mission that makes it unsuitable for Commerce?

EIA's mission is to maintain a central and comprehensive base of energy information. It is logical and highly desirable that this function be closely co-located with energy decisionmakers and other energy programs, as it would be in the current proposal.

## Support Services

Question: According to the justifications, support services cost $10,250 per person.

--For the record, please provide a detail of the make up of this $10,250.

--How does this compare to your 1982 amount?

Answer: The 1983 budget contains funds for the Assistant Secretary for Management and Administration to provide administrative services to EIA which average $10,250 per full-time equivalent staff year for the following categories of services:

| Object Class | | Amount |
|---|---|---|
| 22.0 | Transportation of things | $ 24 |
| 23.2 | Communications, utilities, and rent | 7,720 |
| 24.0 | Printing and reproduction | 964 |
| 26.0 | Supplies and materials | 723 |
| 31.0 | Equipment | 819 |
| | | $10,250 |

The average is the same as 1982. There has been no allowance for anticipated inflationary increases in telephone service, heat, electricity, GSA rent, or any other administrative services.

## Fiscal Year 1983 Proposed Contracts

Question: For the record provide a list of proposed contracts for FY 1983.

Answer: The following is a list of proposed contracts for FY 1983.

| | Estimated Amount (dollars in thousands) |
|---|---|
| **Collection, Production, and Analysis** | |
| Data collections and short-term analysis and forecasts for oil and natural gas | $13,780 |
| Data collection and short-term analysis and forecasting for coal, nuclear, electric, and alternate fuels | 6,000 |
| Data collection and short-term analysis and forecasting for integrated marketingand end use information | 2,100 |
| Computer equipment, software, facilities management, and telecommunications | 10,000 |
| Inquiry response, publication, information dissemination, and related activities | 750 |
| Quality assessment review of data and models and burden control activities | 600 |
| Contract and personnel management information | 50 |
| Total, 1983 contracts | $33,280 |

## Computer Support to Other DOE Organizations

Question: According to the budget justification, p. 121, EIA provides computer support for energy information to other government organizations on a reimbursable basis. For the record, please tell us how much this was in 1981, and what you think it will be in 1982 and 1983.

Answer: The EIA provides its computer services to other Department of Energy components, not other government agencies. The Cost Recovery Information System (CRIS) computes user charges based upon actual computer resources used and prepares monthly and year-to-date statements. These statements provide information to users regarding actual computer resources used in their work. As was stated earlier, some of this work is funded by a transfer of funds, depending upon the nature of the request. FY 1983 support has not been estimated due to pending organization and budget changes. However, total FY 1983 support to all organizations should not exceed FY 1982 support. Based upon CRIS, EIA provides the following computer support to other DOE organizations.

| Organization* | FY 1981 | Estimated FY 1982 |
|---|---|---|
| Office of Secretary of Energy | $ 32,625 | $ 0 |
| Inspector General | 105 | 1,000 |
| Hearings and Appeals | 145,900 | 120,000 |
| Economic Regulatory Administration | 1,989,016 | 850,000 |
| Conservation and Solar (1981) | 139,070 | |
| Conservation and Renewable Energy (1982) | | 365,000 |
| Resource Applications | 99,143 | NA |
| Strategic Petroleum Reserve | 167,046 | 350,000 |
| Environment | 166,820 | NA |
| Fossil Energy | 41,245 | 100,000 |
| Chief Financial Officer | 9,390 | NA |
| International Affairs | 48,725 | 5,000 |
| Policy and Evaluation (1981) | 535,175 | |
| Policy, Planning, and Analysis (1982) | | 510,000 |
| Administration (1981) | 2,109 | |
| Management and Administration (1982) | | 15,000 |
| Controller | 2,579 | 3,000 |
| Regions | 3,589 | 2,000 |
| Federal Energy Regulatory Commission | 1,264,895 | 1,350,000 |
| Congressional, Intergovernmental, and Public Affairs | NA | 13,234 |
| Environmental Protection, Safety, and Emergency Preparedness | NA | 250,000 |

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* A major reorganization during 1981 resulted in the deletion of some support areas and the creation of others. A "NA" notation indicates that no estimate can be made, since the organization was either created or disbanded in the reorganization.

** These statements provide information to the users of the EIA Computer and do not represent reimbursements or funds transfers to EIA.

## Computer Resources

Question: Provide for the record a complete listing of EIA's computer resources with an explanation as to whether these resources are leased or purchased.

Answer: The EIA has the following computer resources:

| Computer Resource | Owned | Leased |
|---|---|---|
| Central Processing Units (IBM 370/3033) | 2 | |
| Card Read/Punch | 1 | |
| On-Line Printers | 4 | 2 |
| Controllers | 2 | |
| Magnetic Tape Units | | |
| Controllers | 2 | |
| Tape Drives | 16 | |
| Alternate Consoles | 2 | |
| Magnetic Disk Units | | |
| Controllers | 10 | |
| 200,000,000 Byte Drives | 24 | |
| 317,500,000 Byte Drives | 80 | 8 |
| Communications | | |
| Comm Controller | 4 | 2 |
| T-Bar Controllers | 6 | |
| T-Bar Switching Unit | 400 | |
| 2914 Switching Unit | 1 | |
| Power Equipment | | |
| Motor Generators | 2 | |
| Static Converters (UPS) | 3 | |
| Storage Batteries (UPS) | 1 | |
| Diesel Generators | 2 | |
| Multi-Functional Cluster Terminals | | |
| Controllers | 11 | 12 |
| CRT Displays | 166 | 159 |
| Printers | 38 | 28 |
| Video Terminals | | |
| CRT Displays | 21 | 197 |
| Printers | 21 | 151 |
| Controllers | 10 | |
| Graphics Terminals | | |
| CRT Displays | 13 | |
| Printers | 11 | |
| Plotters | 2 | |
| Input Tablet | 1 | |
| Portable Terminals | 24 | 46 |
| Remote Batch Terminals | 7 | |
| Other Terminals | | |
| Digital Plotters | 2 | |
| Printer Terminals | | 3 |
| Letter Quality Printers | | 6 |

## Secondary Source Data

Question: The Department of Transportation publishes a monthly motor gasoline report by State

--Do you in any way assist in this publication or use its data?

--What other examples are there of energy information that is collected by organizations other than EIA?

Answer: The EIA does not currently participate in the production of the Department of Transportation's motor gasoline series. EIA does use the miles-per-gallon information in its analytical activities and the sales data is used as a comparison to EIA's data concerning deliveries.

In 1979 and 1980, the EIA worked with the Department of Transportation to revise the gasoline data collection form, the MF-33G series, to obtain information for determining voluntary conservation targets under section 211 of the Emergency Energy Conservation Act. Following the successful completion of targets for each State in December 1980, that program was discontinued.

Examples of energy information collected by other Federal agencies includes gasoline price data gathered by the Bureau of Labor Statistics as part of the Consumer Price Index, energy source import and export data collected as part of the Department of Commerce commodity program, and mineral resource information gathered by the U.S. Geological Survey, which includes coal resource information. The EIA has worked with each of these agencies in their development of the information programs in an attempt to meet all applicable laws with minimal duplication.

## QUESTIONS SUBMITTED BY CONGRESSMAN TOM RAILSBACK

### Commercial and Industrial Consumption Surveys

Question: Is collection of the commercial and industrial consumption surveys required by law?

Answer: The collection of commercial and industrial energy information is not specifically mandated by law. However, Section 52 of the Federal Energy Act requires the Administrator to operate a system which "shall contain such information as is required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the United States." It is the judgment of the Energy Information Administration that commercial and industrial surveys do not need to be conducted every year to fulfill these requirements.

Question: How are nonresidential building and boiler energy consumption data used? Will it aid in monitoring building and equipment energy efficiency?

Answer: Nonresidential building energy consumption data are used for a variety of purposes, including:

- Providing estimates of energy consumption and fuel use patterns by such characteristics as building type, age of building, and presence or absence of certain conservation features.
- Providing information needed to formulate and evaluate policies and programs, such as the Commercial Conservation Service.
- Providing information on market potential for energy conservation supplies and equipment.
- Providing information on price structure by fuel type.
- Projecting expected future fuel use patterns.
- Measuring the permeation and effect of public and private energy conservation programs.
- Providing input for various consumption models of the commercial sector.

The data will aid in monitoring building energy efficiency. However, boiler energy consumption data are not directly measurable as a subset of total consumption. The nonresidential energy consumption survey collected information on presence and number of boilers, and the fuel or fuels used to fire the boilers, but did not collect information about the percent of total consumption of boiler fuels that was devoted to firing boilers, as opposed to other end uses.

The results of this survey, when compared with results of a reinterview survey now scheduled for 1983, will provide measures of change in building energy use and energy efficiency.

Question: Does the industrial consumption survey provide knowledge of boiler and machinery fuel switching capabilities? Will the information prove useful during a petroleum shortage?

Answer: Yes, the survey does provide knowledge of boiler and machinery fuel switching capabilities. The survey collected data on the fuel burning capabilities and experiences of large combustors for 1979. A report has been issued on these alternative fuel burning capabilities (DOE/EIA-0304), entitled, Industrial Energy Consumption, "Survey of Large Combustors: Report on Alternate Fuel-Burning Capabilities of Large Boilers in 1979".

The information collected would prove useful during a petroleum shortage. However, because of incomplete returns, it was necessary to aggregate the data to the extent that alternative fuel burning capabilities may be identified only for broad industrial sectors within five regions of the United States.

Question: Does any private source provide nonresidential building and boiler energy consumption data?

Answer: There is no known source of building energy consumption data for the United States other than the nonresidential buildings energy consumption survey. In fact, to our knowledge, there has been no other national probability sample survey of the nonresidential building population for any purpose. Efforts have been made in both the public and private sectors to measure energy consumption in certain types of buildings and the effects of energy conservation features. These efforts have generally taken the form of case studies.

Question: Will the Census Bureau's "Annual Survey of Manufacturers" continue to provide industrial energy consumption on a yearly basis?

Answer: No. The funding for the energy portion of the Annual Survey of Manufacturers was previously provided by EIA. The EIA no longer funds this activity. The Census Bureau does not plan to provide these data on an annual basis in the absence of EIA funding.

Question: Was the industrial survey fully completed as originally intended?

Answer: No. On February 20, 1981, the Office of Management and Budget informed the Department of Energy that data collection authority for this survey had been withdrawn. At that time, responses had been received from approximately 76 percent of the final survey frame.

Question: Did the Office of Management and Budget (OMB) approve the original industrial survey? If not, please explain.

Answer: Yes. The Office of Management and Budget approved this survey on October 15, 1980. The OMB number was 038-580011.

Question: Does EIA have OMB assurance that the industrial survey will be approved for future use?

Answer: No. It is not in accordance with standard procedures for OMB to give assurance of commitments to future surveys in advance of receipt of an SF-83, Request for OMB Review, requesting clearance of the form.

## Financial Reporting System

Question: Is the Financial Reporting System (FRS) required by law?

Answer: Yes, the FRS is required by Section 205(h)(2) of the Department of Energy Organization Act.

Question: What are the other sources of energy company financial information? Is that information uniform and easily compared?

Answer: Other sources of energy company financial data include:

Government Forms:
- SEC 10-K Annual Report to the SEC
- IRS-1120 U.S. Corporate Income Tax Return
- FTC-LB Line of Business Report
- FTC-CPR Corporate Patterns Report
- MA-13-K Annual Survey of Oil and Gas (Census)

Private Sources:
- Compustat, summarizes 10-K information and adds some items such as share sales
- Major Banks, e.g., Chase Manhattan
- Company Annual Reports to Shareholders
- Company public statements and press releases

The information available from other sources is uniform to a limited extent and can sometimes be compared.

Question: A new, streamlined form has been submitted to OMB for approval. How is the new form different? Will some information not be collected? If not, what types of information will no longer be collected?

Answer: The new form differs from the old form because of better layout and fewer data elements. To achieve fewer data elements (1) old data elements used together were combined, (2) old data elements which were not used in report preparation because of conceptual problems were dropped, and (3) old data elements which in our judgment yielded little information were dropped. All data elements which are required to produce the "Performance Profiles of Major Energy Producers" report would be retained.

Question: According to OMB, the paperwork burden is excessive. Does EIA have estimates for the burden average for the respondents during the first survey? If so, how do the estimates compare with the burden average for the latest survey (1980)? If the average has decreased, please explain why.

Answer: EIA's estimate of average respondent burden did not change and is 4,500 hours for the old form. EIA's estimate of average respondent burden for the proposed new form is 2,000 hours, a 60 percent reduction.

## Petroleum Product Price, Supply, and Market Distribution Data Program

Question: What law require collection of information for the petroleum product, price, supply and market distribution data program?

Answer: The Federal Energy Administration Act and the Emergency Energy Conservation Act require collection of information concerning petroleum product price, supply and market distribution.

Question: Are there private sources of small and mid-size retailer and jobber data?

Answer: There is no comprehensive, documentable, single private source of small-size retailer and jobber data. Some of the data available include a sampling or selection of small retailers and jobbers but do not show data separately for those segments of the market. For example, Lundberg Survey, Inc. collects motor gasoline price data for approximately 16,000 stations but does not publish estimates by size of station. Similarly, the Lundberg Share of Market Report includes jobber volumes but does not break out those volumes separately.

Question: Are there private sources of state-level price and supply data?

Answer: Even though there are several sources of spot, terminal, posted and city prices such as Oil Daily, Lundberg, Platt, there are no known private sources of state-level price and supply data.

Question: What state-level data is now available under the EIA petroleum product price, supply and market distribution data program?

Answer: State level data under the EIA petroleum product price, supply and market distribution data program is provided through: the EIA-172, "Sales of Fuel Oil and Kerosene," (annual); the EIA-174, "Sales of Liquified Petroleum Gases," (annual); the EIA-9A, "No. 2 Distillate Price Monitoring Report," (monthly); and the EIA-25, "Prime Supplier's Monthly Report." A historical data series through September 1981 also provides state level data through the P306, "Refiner/Importer Monthly Report of Petroleum Product Distribution," the P314, "Monthly Survey of Distillate and Residual Fuel Oil Sales to Ultimate Consumers," and the P315, "Monthly Survey of Propane Sales Volumes to Ultimate Consumers." Data from these latter three forms are no longer collected but some of the information (along with the EIA-25, EIA-9A, and EIA-460) is planned for collection in the proposed EIA-782, 783, "Quarterly Petroleum Product Sales Reports" integrated survey effort, scheduled for implementation January 1, 1983.

Question: If EIA discontinues state-level price and supply information, will State governments develop their own data collection capabilities? Can States afford to collect the information? Will it be collected in a uniform manner, both in quality and quantity?

Answer: EIA is continuing to collect most of the State-level petroleum price and supply information it has been previously collecting, as described in the above answer. Therefore, it is uncertain whether States would develop their own capabilities if EIA were to discontinue its collections. However, these issues were explored in workshops held with the States in regard to the proposed "strawman" EIA-782 and 783. There appears to be a mixture of State capabilities and intentions. Many States expressed concern over diminished budgets, and staffing, as well as the lack of uniformity that would result from State collection of data with respect to quality, comprehensiveness and consistency.

. These issues, as well as others, will be further addressed in a public hearing on the proposed EIA-782 and 783.

Question: If an energy emergency were to occur and if no Federal response plan exists, could private industry handle the situation without uniform State-level data? If the Federal government were forced to step in, would it be able to respond without uniform State-level data?

Answer: The fundamental mission of the EIA is to provide accurate and timely information to decisionmakers within and outside government so that they may make informed decisions about energy, including potential emergency situations. This is true whether we are operating in regulated or free market environment. Even efficient operation of free markets require certain basic information. Thus, the EIA consults with private industry, both individual firms and their representative trade associations, as well as other users, such as Federal agencies, State governments and Congressional staff in determining the types of information it will gather. Private industry is the best judge of the types of State level data they need from a Federal data program and those needs are being taken into consideration in the current redesign of EIA's petroleum marketing surveys. Likewise, the needs of Federal program managers responsible for emergency preparedness planning are also being considered to insure (1) the continued availability of information needed for monitoring purposes and (2) the retention of the institutional capability to expand upon basic collections to obtain more detailed information should the need arise.

## IMPACT OF CONGRESSIONAL INACTION ON EIA LEGISLATION

Mr. YATES. Here we are launching you for fiscal year 1983, and you are being reduced by $25 million. Are you going to be able to handle all your responsibilities for the amount of $54,500,000?

Mr. EVERED. With the proposed legislative repeal, yes, sir.

Mr. YATES. Suppose it isn't passed. Then you are in trouble. You can't do it if the legislation isn't passed, can you?

Mr. EVERED. If the legislation is not passed, Mr. Chairman, I would not be able to fulfill all of my statutory responsibilities at the $54.5 million level.

Mr. YATES. All right. Presumably Congress will go back, Congress will adjourn about October 1st, because members go back for elections.

Suppose we don't pass this until a week before adjourning? Does that hurt you at all? You will be a month into your fiscal year.

Assuming it passes, you won't be hurt by that, then, will you?

Mr. EVERED. Assuming it passes, presumably there would not be damage in a week or a few weeks.

Mr. YATES. Are you going to ask for a supplemental for any of your programs in 1982?

Mr. EVERED. No, sir.

Mr. YATES. Should there be a rescission in 1982?

Mr. EVERED. No, sir, I do not recommend a rescission.

Mr. YATES. Will there be a budget amendment for fiscal year 1983 based on the passage of the legislation?

Mr. EVERED. If the legislation is passed, none will be required. If the legislation is not passed, we will have to reconsider——

Mr. YATES. You'll have to come in for a supplemental, won't you?

Mr. EVERED. Consider what resources are necessary and take what steps are required to secure them.

Mr. YATES. Has the $25 million reduction been reflected in the President's budget?

Mr. EVERED. Yes, sir.

Mr. YATES. It has been. So that assumes the legislation will be passed.

Mr. EVERED. Yes, sir.

Mr. YATES. I wonder how many such instances there are of where the President's budget is based upon passage of legislation. Probably lots of them.

Mr. EVERED. I don't know.

Mr. YATES. Anything you want to tell us before we say fini?

Mr. EVERED. Mr. Chairman, just that I am delighted to be here. This is my first appearance before your subcommittee. I enjoyed it thoroughly and look forward to other such opportunities.

Mr. YATES. We are glad you enjoyed it. It's been an interesting experience for the committee as well.

Thank you very much.

MONDAY, MARCH 22, 1982.

## OFFICE OF THE FEDERAL INSPECTOR FOR THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

### WITNESSES

**JOHN T. RHETT, FEDERAL INSPECTOR**

**PETER COOK, DEPUTY FEDERAL INSPECTOR**

**JAMES M. TRENT, ASSISTANT DIRECTOR, FINANCIAL MANAGEMENT**

### OPENING REMARKS

Mr. YATES. Now we have the Office of the Federal Inspector for the Alaska Natural Gas Transportation System and its request for appropriations for fiscal year 1983.

Mr. RHETT. Good afternoon, Mr. Chairman.

Mr. YATES. Appearing in support of that appropriation is the Federal Inspector, Mr. Rhett; Peter Cook, who is the Deputy Federal Inspector; and Mr. Trent, who is the Assistant Director for Financial Management. Your statement, Mr. Rhett, may be made a part of the record at this point.

# STATEMENT OF JOHN T. RHETT
# FEDERAL INSPECTOR
# OFFICE OF THE FEDERAL INSPECTOR
# FOR THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

Before the Appropriations Subcommittee
on the Department of the Interior and Related Agencies

House Appropriations Committee
March 22, 1982

Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear before you today to discuss our budget request for fiscal year 1983 and the status of the pipeline project. I am John T. Rhett, Jr., the Federal Inspector for the Alaska Natural Gas Transportation System. With me are Mr. Peter Cook, the Deputy Federal Inspector for Washington, D.C.; and Mr. James Trent, the Director of Financial Management.

As you know, the Alaska Natural Gas Transportation System is one of the most ambitious construction projects undertaken in modern times. It is the most expensive project to be privately financed, the most expensive pipeline project in the world, and the first buried, chilled gas pipeline ever built. When completed, the 4,800 mile pipeline system will traverse 11 states and four Canadian provinces, from the north slope of Alaska to the Chicago and San Francisco areas.

Construction of the system will occur in two stages. The first will involve construction of portions of the Eastern and Western Legs--referred to as "prebuild" or Phase I construction--to transport natural gas from Alberta, Canada to the lower 48 States. Early delivery of Albertan gas will require construction of 530 miles of the Canadian system, and 823 miles of the Eastern Leg and 160 miles of the Western Leg in the United States. The Western Leg prebuild system became operational in October 1981. Construction of the Eastern Leg began in May 1981 and is proceeding basically on schedule. When mainline construction halted for the winter in early December, approximately 635 miles pipeline work was completed. In addition, over one-half of the miles of the Eastern Leg in Canada is complete. The first phase of construction on the Eastern Leg is scheduled for completion by late 1982, at which time approximately 1.2 billion cubic feet of Albertan gas will begin flowing daily to the U.S.

The second phase of the project will be the completion of the Alaskan, northern Canadian, and lower 48 portions necessary to deliver the Alaskan natural gas to the continental U.S. The Prudhoe Bay gas conditioning plant will also be built during the second phase of the project. Because of the volume of gas to be transported, the gas conditioning plant will be the largest of its kind in the world.

The magnitude of the project, the massive procurements required, the logistics involved, and the range of ecosystems affected pose an awesome challenge to all of the project's participants. The challenge presented by this project is made even greater by the need to get the pipeline built expeditiously. The completed system will supply about four percent of our Nation's gas needs for the 25-year life of the project, which is equivalent to 400,000 barrels of oil per day. It will be designed to carry about 2.4 billion cubic feet of natural gas daily from Prudhoe Bay to homes and industries in the lower 48 States. The pipeline can be expanded to carry additional volumes of both Alaskan and Canadian gas--up to 3.2 billion cubic feet per day with additional compression.

The Alaska Natural Gas Transportation System will also support the twin goals of greater American energy independence and increased American production at a most critical time. While substantially adding to America's energy supplies, it will also provide greater opportunities for U.S. workers and industries.

The timeliness, quality, and cost-effectiveness of pipeline construction will to a large extent depend upon cooperative and coordinated efforts of all participants in the project--the sponsor companies; the Federal, State and local governments in the U.S.; the Canadian Government; and interest groups. The sheer size of the project, the problems presented by arctic conditions, and the requirement to protect some very sensitive environments underscore the need for a coordinated effort. Indeed, it will be critical to the project's progress.

The pipeline is the largest joint energy project ever undertaken by two nations. As such, it requires--and has received--the continued cooperation of both the U.S. and Canada. The Canadian Government authorized early transport of Albertan gas in the summer of 1980, and now that gas is flowing through the prebuild system to U.S. customers in southern California. The Canadians have received assurances from the U.S. that the project will be completed, and are eager to move forward with the project. In other words, expeditious completion of the system will also help assure continued good relations with the Canadian people.

As Federal Inspector, I am responsible for coordinating all Federal activities related to the construction of the pipeline, and specifically for scheduling, expediting and enforcing the permitting actions of eight Federal agencies. Under the Alaska Natural Gas Transportation Act of 1976 and the President's Decision and Report to Congress, the mission of the Office of the Federal Inspector (OFI) is to assure timely completion, quality of construction, cost control, safety, and environmental protection. These responsibilities are basically divided into two phases. The first involves review and approval of the sponsor companies' management plans; final design and cost estimates; construction schedules; environmental protection measures; quality assurance and control procedures;

and plans for equal employment opportunity and minority business participation. These tasks are accomplished in conjunction with the permit scheduling and expedition process, the bulk of which is also conducted prior to the start of actual construction. The second phase focuses on the enforcement by the OFI of the terms and conditions of permits issued by participating Federal agencies, other project-specific Federal authorizations, and Federal laws transferred to my authority for the duration of the project. To ensure proper compliance with these requirements, my staff will conduct periodic on-site inspections and review progress and compliance reports prepared by the sponsors.

Because the OFI is the focal point for all Federal decisionmaking on the project, delays resulting from conflicting government requirements will be minimized. Furthermore, as the single Federal decisionmaker during construction, I can ensure that every Federal requirement reflects a balanced approach to the entire range of project-related objectives. My philosophy is to develop a climate in which the private sector has every opportunity to build this system safely, efficiently, and expeditiously, consistent with Federal requirements. Finally, I strongly believe that close working relationships with all groups involved in the pipeline project are extremely important if we are to identify and resolve problems early, and thereby avoid delays and cost overruns later on.

I would now like to discuss the current status of the pipeline project, as well as the impacts of some recent developments on the project itself and the operations of the Office of the Federal Inspector.

About 1,195 miles of the system are completed and, by this fall, about one third of the total system will be finished. (An additional 394 miles of pipeline have been constructed on the Western Delivery System, a facility that is related to, but not part of, the Alaska Natural Gas Transportation System.)

To date, Phase I construction has proceeded quite well and most of the problems encountered have been resolved. However, there is one problem area--welding--that we are looking into. While no single cause has been specifically identified, the problem seems to stem from the fact that the pipe used on the Eastern Leg has a higher grade, greater weight and wall thickness, and larger diameter than is normally installed in the United States. We will continue to closely monitor the sponsor's efforts to determine the cause of this problem. In addition, the information gained from this and other experiences on the Lower 48 portions of the system is being evaluated in an attempt to eliminate future problems when construction gets underway in Alaska. Although some welds on the Eastern Leg will have to be repaired, we expect that this work can be completed in time to allow the Eastern Leg to begin operation on schedule.

As you know, the sponsor for the Alaskan Leg of the system, Northwest Alaskan Pipeline Company, has not yet been able to secure financing, even though intense negotiations have been continuing for some time. One of the major obstacles had been, until recently, the provision of the President's Decision which barred the producers of the gas--Exxon, Arco, and Sohio--from having any equity in the transportation system. This prohibition had effectively been cutting off a major source of capital investment for the project. Another factor has been the problems involved in constructing a pipeline in a remote, rugged environment such as Alaska. The costs for a project of this nature will inevitably be higher than those for more routine pipeline construction.

To remove other roadblocks to private financing and thus expedite the project, President Reagan in October 1981 invoked Section 8(g) of the Alaska Natural Gas Transportation Act to request waivers of certain laws governing the project. The waiver proposal was approved by Congress and signed into law in December 1981. Enactment of the waiver proposal changed the laws such that the gas producers may have equity in the transportation system. In addition, the Prudhoe Bay gas conditioning plant is now legally part of the project, and the Federal Energy Regulatory Commission (FERC) now has the responsibility for establishing the date upon which the sponsor companies can begin billing consumers for the cost of the completed portions of the system--the Canadian segment, the Alaskan Leg and the gas conditioning plant. This waiver provision provides that if one segment of the pipeline system is completed, the sponsor of the completed segment may begin billing the consumers on the date established by the FERC, regardless of whether gas is flowing or the other segments are finished. The Canadian sponsors have always maintained that they could not obtain financing unless they were allowed to begin collecting their tariff upon completion of the Canadian segment. Thus, the waiver provided that the Canadian sponsors can bill for the "full" cost of service--which includes return on, and of, equity investments, actual operation and maintenance charges, actual current taxes, and amounts necessary to service debt--when the Canadian segment is completed. Upon completion of either the conditioning plant or the Alaskan Leg, the sponsors may begin collecting actual operation and maintenance charges, actual current taxes and amounts necessary to service debt for the completed portion. The sponsors may not receive any return on, or of, their equity investment in the Alaskan pipeline segment or the gas conditioning plant until gas begins to flow.

While there is an outside possibility that consumers may be charged for the costs of constructing the system before they receive the gas, FERC--in consultation with the Office of the Federal Inspector--will carefully analyze all the risks involved in a construction project of this nature before establishing the date that such charges may commence. That consumers will be billed before gas starts flowing is not a certitude. Furthermore, the incentive to complete the system by the "date certain" established by FERC is especially great for equity investors in the U.S. segments--primarily the gas producers and sponsors--since they would receive no return on, or of, their equity investment until gas flows.

Since the passage of the waiver proposal, financing negotiations between the sponsor, the producers and major lending institutions have intensified. The focus of their discussions has been on the precise level of debt and equity participation by the producers and the sponsors and the terms under which debt funds will be provided. In addition, discussions have been held with the State of Alaska and others regarding their possible participation in the financing of the project.

On March 16, 1982, the FERC held a conference concerning the overall status of the sponsor's application for a Certificate of Public Convenience and Necessity for the Alaskan segment and the gas conditioning plant. The meeting was called by FERC to explore certain issues concerning the Certificate, including the determination of ownership of the gas conditioning plant; cost allocation and marketability concerns; antitrust implications of producer participation; and procedures for handling the entire certification process.

At the March 16th conference, the sponsor for the Alaskan Leg announced a change in the full system completion date from the winter of 1986-87 to the winter of 1987-1988, based on the assumption that the overall financing plan can be successfully arranged by June 1982. Until this conference, government and industry had been assuming a winter 1986-87 completion timeframe for planning purposes. Our FY 1983 budget request of $30,471,000 and 205 full-time permanent positions, was geared to a 1986-87 system completion date. It also included funding to relocate most of the Washington, D.C., and Irvine, California, staffs to a new headquarters office in Alaska prior to the start of civil construction there in 1984.

The FY 1983 budget of $30,471,000 represented only a slight increase over the FY 1982 appropriation. This was a major change from earlier projections of program expansion and was primarily due to the construction schedule change for the Alaskan Leg that was announced in mid-1981. The full system was supposed to be completed by 1985-86, but delays in obtaining financing caused a slippage to 1986-87. The effect of this slippage on the FY 1983 OFI budget was to shift most program objectives onto a slower track; however, the level of engineering and environmental design review was not substantially affected by the change in schedule.

The FY 1983 request of $30,471,000 also reflected the fact that prebuild construction would be winding down. The Western Leg is already operational, and once the Eastern Leg is fully operational in the first quarter of FY 1983, all activities on Phase I of system construction will come to an end. The decreased spending resulting from schedule changes and prebuild completion, plus the higher costs resulting from inflation, relocation to Alaska, and continued design review produced the net increase of $3,046,000 in the budget from FY 1982 to FY 1983.

The March 16th announcement by the sponsor company that the construction schedule had slipped to a 1987-88 completion date will have a definite impact on the the operations of and budgets for the OFI. This is because our level of activity, and thus resource requirements, are based upon the construction schedules projected by the private sponsors. Schedule changes have occurred before, and we have always adjusted our budget estimates to reflect revisions. In the past, when it appeared that a schedule slippage was likely, we immediately analyzed its impact on our budget to ensure speedy processing of any revisions. Consequently, we are now in the process of discussing a possible budget reduction with the Office of Management and Budget.

The items under discussion include a delay in the relocation of most of our Washington, D.C., and Irvine, California, staffs to Alaska and a reduced need for personnel in 1983. We are also discussing additional activities possible to support the gas conditioning plant, which was not included in the transportation system until recently.

The specifics of any revision in our FY 1983 request will be immediately relayed to you once they are finalized.

In spite of the changes that are now occurring in the project, the fact that almost one-third of the system has been constructed illustrates that the project is moving forward. Gas is flowing through the Western Leg of the prebuild system, and steady progress continues on Eastern Leg prebuild construction, and in the areas of design review, field surveys, auditing and expedited permit processing. The agency is also continuing to refine policies, procedures and organizational mechanisms to ensure safe, cost-effective and timely pipeline construction, as well as to fulfill its responsibility for coordinated Federal oversight of the project. While the OFI has accomplished a great deal to date, we have deliberately kept our build-up of staff and operations to a minimum as a result of the construction schedule uncertainties for the Alaskan Leg. Consequently, our current full-time permanent on-board strength stands at only 138 employees.

In formulating our budget requests in any given year, we use two very important guidelines. The first is that we believe it is far more efficient to utilize contract support for highly specialized, short-term studies. The types of skills required for a project of this nature are in short supply in the government today, and hiring a full-time permanent staff of experts for a project of such limited duration would prove very costly to the government in the long run. The second guideline concerns the extent of our regulatory responsibilities--our job is to oversee the sponsors' activities, and not perform the required work for them. In addition, we must apply the requirements of law in a reasonable and balanced fashion to assure not only expeditious, but also cost-effective, construction. Both of these philosophies contribute toward keeping our budget requests to the minimum necessary to get our job done well.

In order to fulfill the mission of the OFI and to ensure successful completion of the project, especially in light of the challenges this project poses, sufficient resources for agency operations will be essential. With proper staffing and funding to carry out all oversight and enforcement functions, delays and cost overruns during construction will be minimized, ultimately resulting in less costs for American gas consumers.

Mr. Chairman, that concludes my presentation. While I realize that our budget request is in a state of flux, which may complicate a discussion at this time of our FY 1983 requirement, I will do my best to answer any questions you may have.

### FINANCING DIFFICULTIES

When you last appeared the project was still having financial difficulties. Is that still true?

Mr. RHETT. Yes, Mr. Chairman. It is. On the 16th of March, another slip of a year was announced by the sponsor because of the difficulty in getting financing.

Basically, financing could not be accomplished until such time as the waiver package was passed, which occurred in December. This permitted the oil companies, primarily the three major oil companies, to participate.

With the passage of the waiver, they, for the first time, were able to join forces to come up with the financing. We had hoped by this time that financing would be secured. They were working hard in January and February toward that goal, or at least the initial part of it.

### BUDGET REVISIONS LIKELY

The goal right now is to try to get the package pulled together by the end of June. This is effectively so late that the schedule will have to slip another year. The budget I submitted to you was based on the old schedule, and I, in turn, will have to submit a revised budget with downward adjustments to reflect the schedule slippage.

I have been working closely with OMB and with the sponsors, and very shortly we should be back up to you with a revised budget.

Mr. YATES. Well, will that budget when submitted have any impact on 1982?

Mr. RHETT. Yes. There will be an impact on 1982, and we are working on it right now. The construction schedule change did not come as a complete surprise. For example, we were authorized 190 employment slots. I only allocated about 168 when the schedule started looking shaky. I then froze our employment at 140, and required every manager to come to me personally for permission to hire.

We are now below 140. Consequently, it is not just pay, but travel, and related costs that have been affected. This whole thing is being wrapped up, and I expect a major cutback in 1982, in the form of a rescission.

### COMPLETION OF THE U.S. WESTERN LEG

Mr. YATES. When did you complete the western leg of the United States portion of the line?

Mr. RHETT. The western leg was completed in October of last year, and, I might add, on schedule and under budget.

Mr. YATES. What portion of it, or what volume of gas flows through that line?

Mr. RHETT. I think 240 million cubic feet per day is what it is designed for. What is flowing right now, I really do not know.

Mr. YATES. Could you put that in the record?

Mr. RHETT. I sure will.

[The information follows:]

### CURRENT VOLUMES OF WESTERN LEG GAS

Between 100 to 240 million cubic feet of gas flows daily through the completed western leg prebuild segment. The specific gas volume varies from day-to-day according to the amount of gas that can be transported through the El Paso system.

### NO OPERATION PROBLEMS WITH THE WESTERN LEG

Mr. YATES. Have there been any operation problems with the western leg?

Mr. RHETT. Not really. There have been the normal construction problems. But otherwise the construction of that segment has gone very, very smoothly. As I reported to you last year, we did have some small welding problems during construction, but we have been able to keep them under control.

### RESPONSIBILITIES FOR THE WESTERN LEG

Mr. YATES. Now that it is operational, do you have any responsibilities with respect to the western leg?

Mr. RHETT. We have responsibility for one year after completion. But, with its completion and the slip in schedule, I am closing the San Francisco office that was overseeing construction. By the end of this month there will be nobody there. The people will be either reassigned or RIFed. We will reopen the office when the second part of construction starts.

Before the slippage, this would not have happened. But with the slippage, there is just no reason to keep the office open. We do have the responsibility for one year of operation, though.

Mr. YATES. What responsibilities do you have? What are they?

Mr. RHETT. It is mainly oversight to protect the consumer interest, by ensuring that the pipeline was built correctly and is operating safely. Failures in the system would generate additional costs that the consumer would have to pay.

### ACTUAL VS. ESTIMATED CONSTRUCTION COSTS

Mr. YATES. How well have the construction costs adhered to the estimates?

Mr. RHETT. Very, very well. They are all extremely close.

### STATUS OF THE EASTERN LEG

Mr. YATES. What is the status of the eastern leg?

Mr. RHETT. The pipe installation on the eastern leg is about 70 percent done, and the compressor station is running a little bit behind this. That one is due to be finished this fall. There have been some construction problems with welding. Again, we seem to have welding problems consistently, but they are under control. There are a number of repairs that will have to be made, but we will still make it on time and under budget.

Mr. YATES. When do you think it will be completed?

Mr. RHETT. Should be flowing gas by next September.

Mr. YATES. Would you place in the record the amount of gas you expect to flow through?

Mr. RHETT. Sure will.

[The information follows:]

### EASTERN LEG PREBUILD GAS FLOW

The initial throughput for the Eastern leg prebuild segment will be 800 million cubic feet of gas per day. After the final compressor station is installed, the ultimate volume to be delivered through this portion of the system will be 975 million cubic feet of gas per day.

### STATUS OF CANADIAN PREBUILD SYSTEM

Mr. **YATES**. What is the status of the Canadian portion of the pipeline?

Mr. **RHETT**. The Canadian western leg prebuild portion is finished. It was finished on 1 October 1981, and is delivering gas. On the eastern leg, 50 percent of the 42-inch pipe that will join with the U.S. pipe has been laid. On the 15th of March the Canadian sponsor started construction again before the winter breakup.

So it is on schedule and under budget.

### CANADIAN APPROVALS GRANTED

Mr. **YATES**. Have the Canadians achieved the approvals they need?

Mr. **RHETT**. They have.

Mr. **YATES**. They have got the permits then?

Mr. **RHETT**. They have their permits.

### STATUS OF FINANCING FOR THE ALASKAN LEG

Mr. **YATES**. OK. What about the Alaskan portion of the line, what is the status of financing for that?

Mr. **RHETT**. The status of financing is that the gas companies and the three oil companies, Arco, Exxon and Sohio, are working on the financial negotiations. At the same time, discussions have been going on with the four lead banks in the United States. Chase Manhattan is one of the banks. And, contacts are being made overseas. Hopefully, by next month, the oil companies and the gas companies will be able to reach some agreement, and by June, a financing plan will be pulled together.

If we do not get a financing plan by that time, we may have to start taking some hard looks again at the schedule, and its impact on our budget. Our work is geared to the level of the sponsors.

### STATUS OF LAWSUIT FILED BY SENATOR METZENBAUM

Mr. **YATES**. What about the status of the lawsuit?

Mr. **RHETT**. The lawsuit is presently in the courts. The briefs have been done. I think there is a hearing on April 8, 1982, and I expect that it will be wrapped up within the 90-day period mandated by the Alaska Natural Gas Transportation Act.

### PARTICIPATION BY THE STATE OF ALASKA IN FINANCING

Mr. **YATES**. What about the State of Alaska, is it participating in the financing?

Mr. **RHETT**. The State is considering it right now. They hired Kidder Peabody to look at it for them. A report is due to the State legislature almost any time now. Whether or not the State is going to participate in the financing, we do not know yet. The time between now and when the legislature adjourns is not really enough to complete everything, but the State may be able to indicate in which way it is moving.

### TIMING OF THE HEADQUARTERS RELOCATION

Mr. **Yates**. What things have to happen in order for your move on Alaska to be feasible?

Mr. **Rhett**. The first and most important thing is we have to have financing. We have to be assured there is a project.

Mr. **Yates**. When are you likely to know that?

Mr. **Rhett**. I would hope sometime this summer. Of course, then, we would take every function we can and start moving it west.

Mr. **Yates**. Are you going to have a Washington office?

Mr. **Rhett**. We will end up with a very small one, primarily for congressional liaison and budget matters.

### RESPONSIBILITIES FOR THE GAS CONDITIONING PLANT

Mr. **Yates**. What are your responsibilities for the gas conditioning plant?

Mr. **Rhett**. The waiver package was just turned over to us.

Mr. **Yates**. Right.

Mr. **Rhett**. Consequently, we have the overall responsibility of assuring, and I emphasize "assuring," that the plant is built correctly and is in the consumers' best interest. This means there is a certain degree of quality assurance we need to do, rather than detailed engineering design review. But, this is a $4 billion to $5 billion plant, which is probably the largest industrial plant ever constructed in the world.

So, it is going to be quite complex. But, I do not think it is going to take a lot of people because it is concentrated in one place. It is going to take a few highly skilled people to follow its design, construction, and operation.

Mr. **Yates**. How long is it going to take to construct it?

Mr. **Rhett**. The plant will take three barge shipments, over a 3-year period, plus a year or so for design. What they do is build the modules in the States and ship them up by barge, which will be 100 by 400 feet. Then they will put the modules together on the foundations that will be built at Prudhoe.

So, it fits within the pipeline construction period which, in total, is about 5 years.

### STATUS OF THE PLANT'S DESIGN

Mr. **Yates**. How far along is the design of the plant?

Mr. **Rhett**. The plant has been designed to the point where the bids can go out for compressors.

The basic selection of processes and design criteria has been done. If the project gets financed, the design could be completed in a short period of time. There have been over 400 people from Parsons Company working on the plant now. Employment is being phased down somewhat now—especially engineers.

## REIMBURSEMENT BY PIPELINE SPONSORS

Mr. YATES. You are to be reimbursed by pipeline sponsors, aren't you?

Mr. RHETT. Yes.

Mr. YATES. How do they meet this responsibility?

Mr. RHETT. It is spelled out in our reimbursement regulations and procedures now in effect. In fact, we are in the process of collecting for our first bill for the Alaskan segment, which should be around $1 million, a little over. We expect, in about a year, to be reimbursed in the neighborhood of $6 million. That would be in 1983, and would represent between 20 and 25 percent of budget. We have also been collecting reimbursement for the eastern leg, the segment going through the Midwest. But the costs that we have been reimbursed for are small because there is not much Federal land—only 30 miles of Federal land in total.

Now, that is not true for Alaska, since about 50 percent of the land there is Federal. So, the reimbursement there will be much higher. That money goes straight to the Treasury; we get funding strictly through appropriations.

Mr. YATES. Would you monitor reimbursements more closely if your operating expenses relied on reimbursements?

Mr. RHETT. I personally do not like that procedure. And we had our choice.

Mr. YATES. Yes.

Mr. RHETT. We chose this. I think there is more discipline in the system the way it is. Right now, the budget first has to be justified to me. I have to justify it to OMB. Then I have to justify it to you and the Senate. If I had money available from reimbursements, I just don't think there would be enough discipline in the system. I prefer to budget, receive appropriations, collect the money, and put that money straight into the Treasury.

I just think it a cleaner way of doing business.

Mr. YATES. I hope so.

Now, would you furnish the committee with a copy of your reimbursement regulations?

Mr. RHETT. Yes, sir.

[The information follows:]

completed, the Commission may see a need to augment the ATWS rule proposed for *existing* plants. * * * We do not belive that this will prove to be the case. But if the Commission lacks our confidence, it may prefer to adopt the Utilities' proposed rule as an "interim" measure, to be finalized in the wake of these efforts, quite possibly at the same time that ATWS requlements are set for new plants."

The petitioner requests that if the Commission decides not to proceed with the rulemaking approach outlined above, an ATWS rulemaking proceeding with formal evidentiary hearings be conducted using certain adjudicatory procedures the petitioner feels are required. The petitioner's recommended adjudicatory procedures are as follows:

1. A hearing board to be appointed from the ASLB and ASLAB panels, composed of technically qualified experts who can bring a fresh approach to the evidence.

2. All relevent documents available to the NRC Staff, including internal memoranda and working papers, to be placed in a technical data bank and made available in one or more public document rooms.

3. A statement of issues to be prepared by the hearing board after statements of contentions are filed by parties and one or more prehearing conferences are held.

4. Written statements of position to be filed by all parties.

5. Written cross-statements to be filed by any party who wishes to respond to other parties.

6. A public hearing to be held, with all parties having an opportunity to present sworn witnesses and documentary evidence in support of their statements and cross-statements.

7. Questioning of witnesses to be conducted by the hearing board, with the parties allowed to submit suggested questions for the board to ask; cross-examination to be conducted by the parties if they specify the issues on which they wish to cross-examine and satisfy the board that cross-examination is needed to explore these issues adequately.

8. A proposed rule to be recommended by the hearing board to the Commission, along with a supporting discussion that explains the evidentiary basis for the rule.

9. Oral argument by the parties before the Commission.

Dated at Washington, DC this [illegible] day of October 1980.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

*Secretary of the Commission.*

[FR Doc. 80-[illegible] Filed 11-3-80; 8:45 am]

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## OFFICE OF THE FEDERAL INSPECTOR FOR THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

## 10 CFR Part 1530

## Reimbursement of Costs

**AGENCY:** Office of the Federal Inspector for the Alaska Natural Gas Transportation System.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** These proposed rules institute standards and procedures by which the Office of the Federal Inspector (OFI) will recover certain costs from the sponsoring companies for the Alaska Natural Gas Transportation System (ANGTS). The sponsoring companies of ANGTS are obligated to reimburse the United States for costs incurred by certain Federal agencies relative to rights-of-way across Federal lands.

While reimbursement, in some form or other, is mandatory, the mechanism for its administration is more flexible. Section 9 of the Alaska Natural Gas Transportation Act (ANGTA) requires, and Section 28(1) of the Mineral Leasing Act (MLA) allows, the OFI to employ a reimbursement mechanism different from that of the Department of the Interior (DOI). Accordingly, the OFI will seek appropriated funds for all activities in its budget, to be followed by the ANGTS sponsors making the necessary reimbursement directly to the U.S. Treasury on a quarterly, after-the-fact basis.

The OFI will not seek reimbursement for any of its permit-coordination activities related to the Department of the Interior (DOI) processing right-of-way and permit applications for use of Federal lands. Nevertheless, a portion of the OFI's enforcement activities will be reimburseable. Reimbursement is first limited to OFI enforcement actions related to ANGTS construction primarily on Federal lands. Reimbursement is further limited to the OFI enforcing Federal agencies specific authority under Section 28 of the MLA. There will be no reimbursement for enforcing the authority of Federal agencies not related to the Grant right-of-way and related permits. Reimbursement applies to the costs associated with OFI field personnel and appropriate headquarters support (engineering review, environmental review, permits and compliance, and related contractors and interagency support) associated with enforcing Section 28-related requirements.

**DATES:** Comments should be submitted by December 4, 1980.

**ADDRESS:** Comments should be in writing and sent to Mr. Ned Hengerer, Office of the Federal Inspector, Room 2413, Post Office Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20044.

**FOR FURTHER INFORMATION CONTACT:** Mr. Ned Hengerer, General Counsel, Office of the Federal Inspector (ANGTS), Room 2413, Post Office Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20044, (202) 275-1144.

**SUPPLEMENTARY INFORMATION:**

### I. Background

The issue of reimbursement was raised by the ANGTS sponsors in the context of the Federal Inspector's July 1979 confirmation hearings. Since then the OFI has been studying the matter. Because of apparent disagreement between the sponsors and the Department of the Interior (the Federal agency primarily involved in reimbursement), the OFI found it adviseable—after consultation with the sponsors and appropriate government officials—to establish a project-specific policy on reimbursement. This policy only governs operations of the OFI.

Recently, however, in a case dealing with Trans Alaska Pipeline System, the Court of Claims ruled that Section 28 (1) reimbursement could only be implemented pursuant to authorizing regulations, as required by the Independent Offices Appropriations Act. *Alyesko Pipeline Service Company* v. *U.S.*, No. 384–78 (CT. Cl. June 18, 1980), slip op. at 8–12. While the status of this decision is still uncertain, the OFI now, out of an abundance of action, establishes these proposed regulations. In this manner our cost reimbursement program could not subsequently be invalidated, were the *Alyesko* decision to become final and binding.

### II. Discussion

### A. Applicability of Reimbursement to ANGTS

ANGTS, as a natural gas pipeline project, is obligated to reimburse the U.S. for certain costs, incurred by Federal agencies, relative to rights-of-way across Federal lands. Specifically, Section 28(1) of the Mineral Leasing Act (MLA), Pub. L. 93.153, 30 U.S.C. 185, requires oil and gas pipeline applicants to reimburse the U.S. for (1)

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administrative and other costs incurred in processing a right-of-way or permit application and (2) costs for monitoring construction and operation of the approved facilities on the right-of-way or permit area.

The reimbursement requirement has not been waived relative to ANGTS. The Alaska Natural Gas Transportation Act (ANGTA), 15 U.S.C. Section 719—while amending the Natural Gas Act and the National Environmental Policy Act, for example, in certain regards—did not alter Section 28(1) reimbursement. Nor has Section 28(1) been explicitly waived, under either Section 7(a)(4)(D) or 8(g) of ANGTA, by joint resolution of Congress. Furthermore, while Section 9(c) of ANGTA circumscribes the exercise of Federal agencies' discretionary authority, the reimbursement requirement itself is mandatory: Section 28(1) is written so that right-of-way applicants and holders "shall" reimburse the U.S. In addition, although Section 202(d) of Reorganization Plan No. 1 of 1979 (establishing the Office of the Federal Inspector) provides a "unified budget" for the Federal Inspector, that unified budget—meant to assist efficient management—does not obviate the reimbursement requirement. Finally, while it controls "direct charges by public authorities," Paragraph 11 of the Agreement Between The United States of America and Canada on Principles Applicable to a Northern Natural Gas Pipeline (Agreement on Principles) in fact contemplates cost reimbursement to regulatory agencies, both in Canada and in the U.S.

Section 1530.1 details the companies which must reimburse OFI monitoring and enforcement costs. This Part covers not only companies sponsoring ANGTS but also companies sponsoring facilities found to be necessary or related to ANGTS.

*B. Reimbursement Mechanism*

While reimbursement, in some form or other, is mandatory, the mechanism for its administration is more flexible. Section 28(1) of the MLA qualifies reimbursement to be "as determined by the Secretary (of the Interior) or agency head." DOI bills for reimbursement in advance of cost incurrence, thereby funding current right-of-way operations with reimbursed funds. While this approach is permitted by law, the OFI is not legally bound to adopt it for its own reimbursable activities, which are substantially different from those of DOI, as related to ANGTS.

The OFI has a valid legal reason for not following DOI's approach. As will be explained below, most of all reimbursable OFI activities will occur in the enforcement—as opposed to the permitting—context. And under Section 202(c) of the Reorganization Plan, the OFI is charged with meeting the mandate of Section 9 of ANGTA as it carries our each Federal agency's enforcement policies and procedures, which in the case of DOI include reimbursement procedures. This means that the OFI must endeavor to avoid delays in project completion. In this vein DOI's advance billing approach to reimbursement—while perhaps feasible in terms of processing right-of-way applications—is incompatible with the more exigent ANGTS schedule during enforcement. Specifically, the OFI's ability to enforce expeditiously and effectively DOI's right-of-way stipulations would be jeopardized if it had to rely on reimbursement payments from the ANGTS sponsors before committing resources for such enforcement. By expressly making this determination now, the OFI is also acting pursuant to Section 1-106 of Executive Order 12142 (44 FR 36927).

Section 9 of ANGTA requires, and Section 28(1) of the MLA allows, the OFI to empoly a reimbursement mechanism different from that of DOI. Accordingly, the OFI will seek appropriated funds for all activities in its budget, to be followed by the ANGTS sponsors making the necessary reimbursement directly to the U.S. Treasury on a quarterly, after-the-fact basis. This method minimizes administrative complications and operational delays inherent when funding current activities with reimbursement funds. Likewise, this method maximizes the OFI's capability to take the initiative in anticipating and thereby avoiding major compliance problems and delays during enforcement, which of course is part of its statutory responsibility.

Billing, payment, and protest procedures appear in §§ 1530.4, 1530.5, and 1530.6 respectively. These procedures are basically self-explanatory. One point of clarification concerns the right-of-way grants upon which reimbursement is predicated. In particular while the Eastern and Western Leg "pre-build" grants merely require reimbursement, the proposed Alaska Leg grant adds that appeals of disputes will be to the Federal Inspector, under procedures set forth at 43 CFR Part 4, Subpart E. While those procedures allow for agency hearings (at the discretion of the agency), the OFI does not contemplate the need for hearings. Because these Part 1530 regulations are so explicit, questions of material fact will be minimized. And most legal questions should be resolved in the promulgation of these substantive regulations.

Thus, while § 1530.6 allows for protests and full documentation of billing complaints, there is no provision for an agency hearing: Should the company remain dissatisfied, it always has recourse to judicial process for monetary claims against the government. As mentioned earlier, the OFI has the necessary authority to make such modifications of the procedures of the Federal agencies whose requirements the OFI will enforce.

*C. Reimbursable Activities*

Only a portion of the OFI's activities will be reimbursable. As explained below and detailed in § 1530.2, there will be no reimbursement for the OFI's role in agency permitting. But a substantial portion of its enforcement budget will require reimbursement.

1. Permitting Activities.—In terms of issuing permits and other authorizations, DOI is mainly associated with reimbursement, because it alone processes right-of-way and permit applications for use of Federal lands. The OFI does not process these applications, and thus it incurs no reimbursable costs.

It is true that the OFI has and, will continue to, consult with DOI concerning the right-of-way grants and related stipulations. Nevertheless, such OFI input comes from its duty—as set forth in Section 9 of ANGTA and Section 202(b) of the Reorganization Plan—to expedite and coordinate Federal agency decisionmaking. As a result, the OFI will not seek reimbursement for any of its permit-coordination activities related to DOI processing right-of-way and permit applications for use of Federal lands.

2. Enforcement Activities.— In terms of enforcing permits and other authorizations, the OFI replaces DOI (and the Department of Agriculture for National Forests) relative to its grants of right-of-way and permits on Federal lands. Monitoring costs are, of course, reimbursable under Section 28(1), and Section 102 of the Reorganization Plan explicitly includes monitoring in the OFI's enforcement duties. Thus, a portion of the OFI's enforcement activities will be reimbursable. The specific percentage of reimbursable enforcement activities is dictated by legal limitations, as well as by assessment of the specific logistical and personnel needs of enforcement.

a. Limits to Reimbursement. Reimbursement is first limited to OFI enforcement actions related to ANGTS construction primarily on Federal lands

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The whole right-of-way and permit program under Section 28 of the MLA is restricted to oil and gas pipelines crossing Federal lands.

Reimbursement is further limited to the OFI enforcing DOI-specific, and not merely DOI-derivative, authority under Section 28 of the MLA. In other words, while the stipulations accompanying the DOI grants of right-of-way reference grantee compliance with the laws of other Federal agencies, such reference does not make OFI enforcement of those other laws also reimbursable.

The right-of-way process under Section 28 is generally meant to protect the government's proprietary interest in Federal lands. Nevertheless, Section 28(f) clearly gives DOI broad regulatory authority over these rights-of-way. For example, Section 28(h) authorizes DOI to ensure environmental protection. Also, Section 28(g) mandates right-of-way terms and conditions to "protect the safety of workers and to protect the public from sudden ruptures and slow degradation of the pipeline."

b. Level of Reimbursement. As detailed in § 1530.3, this reimbursement will cover the appropriate share of the costs of the following OFI offices: Engineering Review, Environmental Review, Permits and Compliance, and the several field offices. The costs to be reimbursed include salaries (and cost of living adjustment in Alaska), benefits, travel, training, household moves, related contract and consultant support (to include interagency arrangements), office expenses (to include relocation, supplies, rent, utilities, communications, and machine rental), material and equipment purchases, vehicle and aircraft rental, and 15% to administer this Part.

In Alaska in particular, logistical support in the field will be provided by the sponsor companies under a detailed agreement by which the OFI will reimburse the sponsors for the costs incurred. This of course is needed because to the remoteness of the ANGTS route. A portion of the OFI payment to the sponsors will in turn be reimbursable by the sponsors, as related to enforcement of the DOI right-of-way grants and permits.

The specific dollar level of Section 28(1) reimbursement will vary year-to-year, depending on such factors as amount of Federal land being crossed, type of preconstruction or construction effort being undertaken, and extent of activity by the various OFI offices in the reimbursable enforcement effort. By way of illustration only, an early projection—voluntarily rendered by the OFI at Northwest Alaskan's request for preparation of its certificate cost estimate—showed reimbursement (in 1980 dollars) on the Alaska segment ranging from a little over $7 million to a little over $10 million per year from 1981 to 1985: The projected percentage of reimbursement to total enforcement budget would fluctuate over this same period as follows: 28%, 19%, 26%, 32%, and 30%.

In the lower 48-states, the amount of Federal land crossed by ANGTS will be much less. Thus, the amount of sponsor reimbursement will be substantially less.

The OFI's method for computing reimbursement is somewhat unique, and intentionally so. Instead of allocating every element of OFI cost between time spent on reimbursable versus non-reimbursable activities, Section 1530.4 will multiply the quarterly costs of the appropriate OFI offices by a specific percentage to determine the reimbursement due. The percentage will be determined annually by the OFI, after consulting with the sponsor companies on their work plans. The OFI recognizes that this approach does not achieve mathematical perfection, but it is fair to all concerned. The OFI cannot meet its statutory mandate to expedite ANGTS if its employees must file daily reports on their exact location and activity relative to Federal lands and DOI-related enforcement.

c. Reconciliation with DOI Practice. The OFI's reimbursement regulation is not fully consistent with DOI practice. This does not, however, represent legal error, whether on the part of the OFI or DOI. The two agencies do not rely on identical legal authority for their respective reimbursement policies. The OFI implements Section 28(1) of the MLA. So does DOI, but it also relies on Section 304 of the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. Section 1734. And in promulgating reimbursement regulations for oil and gas pipelines in 1975 (40 F.R. 17842), DOI relied substantively in part on Title V of the Independent Offices Appropriation Act (IOAA), 31 U.S.C. Section 483a. Reliance on these other authorities justifies any differences between present or past DOI practices and OFI reimbursement policy.

To begin with, Section 304 of FLPMA authorizes DOI to set fees and charges to recover "reasonable costs" for applications related to public lands. In Order No. 3011 (Sept. 28, 1977) the Secretary defined "reasonable costs" as actual costs under the Section 28(1) regulations. Section 304 also authorized DOI to fund current operations through a reimbursement account. While DOI has employed this approach, the statute does not mandate it. As explained earlier, the OFI is not invoking that authority, due to the countervailing mandate of Section 9 of ANGTA.

The IOAA, referenced in DOI's 1975 regulations, authorizes Federal agencies to issue regulations establishing fees or charges to cover various costs. The IOAA leaves administration to agency discretion: Cost recovery is limited "to the full extent possible." The OFI has found that, even if applicable, the supplemental use of the IOAA—beyond reimbursement already mandated by Section 28(1)—is not practicable. In the first place, the unique mission of the OFI is not conducive to the IOAA: The OFI is overseeing one single project, not regulating an entire sector of the economy, as most agencies do. In addition, past implementation of the IOAA has led to a multitude of disputes and lawsuits. Such an eventuality is anathema to OFI's statutory duty to facilitate the expeditious completion of ANGTS. Finally, the OFI's reimbursement regulation already provides for an adequate level of cost recovery for the U.S.

Of course, as explained earlier, the recent Court of Claims *Alyeska* decision has caused the OFI to promulgate reimbursement regulations, as required under the IOAA. This precautionary measure should not, however, be confused with substantive reliance on the IOAA. In *substantive* terms, OFI reimbursement is predicated solely on the legal authority of Section 28(1) of the MLA, even though the IOAA *procedural* requirement of implementing regulations is also employed.

## III. Conclusion

The OFI is requesting public comments on any provisions of this proposed reimbursement regulation or related preamble. Because the OFI will be issuing the final rule on these reimbursement regulations (after reviewing the public comments) as a final agency action pursuant to Section 9 of ANGTA and/or as a "decision on enforcement matters" pursuant to Section 202(a) of the Reorganization Plan, all interested persons are urged to comment now.

This proposed reimbursement regulation does not constitute a significant rule, requiring analysis under Executive Order 12044. Nor do the requirements of 42 U.S.C. Section 4332(2)(c) apply.

Under authority of Section 9 of ANGTA, 15 U.S.C. Section 719g; Sections 102 and 202 of Reorganization Plan No. 1 of 1979; Section 28(1) of the MLA, 30 U.S.C. Section 185; and 31 U.S.C. Section 483a, the OFI is now proposing to amend Title 10 of the Code

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of Federal Regulations by adding a new Part 1530, as set forth below.

Dated: October 28, 1980.

John T. Rhett,

*Federal Inspector.*

## PART 1530—REIMBURSEMENT OF COSTS

Sec.
1530.1 Coverage.
1530.2 Reimbursable activities.
1530.3 Costs to be reimbursed.
1530.4 Billing procedures.
1530.5 Payment procedures.
1530.6 Protest procedures.

Authority: Section 9 of the Alaska Natural Gas Transportation Act, 15 U.S.C. Section 719g; Sections 102 and 202 of Reorganization Plan No. 1 of 1979, 44 FR 33663 (made effective by Executive Order 12142 of June 21, 1979, 44 FR 36927); Section 28(1) of Title I of the Mineral Leasing Act, 30 U.S.C. Section 185; and 31 U.S.C. Section 483a.

### § 1530.1 Coverage.

(a) This Part applies to the companies sponsoring the segments of the Alaska Natural Gas Transportation System (ANGTS) in the United States, as listed in the President's *Decision and Report to Congress on the Alaska Natural Gas Transportation System* and as subsequently restructured, renamed, or otherwise changed. It also applies, where appropriate, to persons or companies acting as agents for these sponsoring companies.

(b) This Part also applies to companies sponsoring facilities which have been determined to be "necessary or related to" ANGTS, within the meaning of Section 9 of ANGTA, and thereby come within the OFI's enforcement authority.

(c) This Part governs how the OFI will obtain reimbursement from the sponsoring companies (described above in §§ 1530.1 (a) and (b)) for the costs incurred in certain of its ANGTS-related enforcement activities. It does not govern how any other Federal agency might seek similar reimbursement from the sponsoring companies for ANGTS-related nonenforcement activities.

### § 1530.2 Reimbursable activities.

(a) The sponsoring companies shall reimburse the United States for the OFI's costs incurred in enforcing ANGTS right-of-way and permit requirements on Federal lands, as directly required by Section 28 of the Mineral Leasing Act.

(b) Enforcement, the costs of which are reimbursable under § 1530.2(a) immediately above, entails monitoring and any other compliance or oversight activities reasonably related to the OFI enforcement process, as established by Section 102 of Reorganization Plan No. 1 of 1979.

### § 1530.3 Costs to be reimbursed.

(a) The OFI will require reimbursement for the activities, defined by § 1530.2 of this Part as reimbursable, of the following OFI offices:

(1) Engineering Review;
(2) Environmental Review;
(3) Permits and Compliance; and
(4) Field offices located in
(i) Anchorage, Alaska,
(ii) Fairbanks, Alaska,
(iii) San Francisco, California,
(iv) Irvine, California, and
(v) Omaha, Nebraska.

(b) The specific costs of reimbursable activities are limited to the following:

(1) Employee costs for
(i) Salaries,
(ii) Cost-of-living allowance (but only in Alaska),
(iii) Benefits,
(iv) Travel,
(v) Training, and
(vi) Household moves;
(2) Outside support costs for
(i) Contractors,
(ii) Consultants, and
(iii) Interagency arrangements, whether pursuant to a
(A) Delegation under Section 202(a) of Reorganization Plan No. 1 of 1979, or
(B) Formal cooperative work sharing agreement under the Economy Act;
(3) Office expenses for
(i) Relocation,
(ii) Supplies,
(iii) Rent,
(iv) Utilities,
(v) Communications, and
(vi) Machine rental;
(4) Material and equipment purchase or rental;
(5) Vehicle and aircraft purchase or rental;
(6) Any of the above or other support services provided by the sponsoring companies in the field on a cost recovery basis under logistical support agreements between the OFI and the sponsoring companies; and
(7) Costs to administer this Part equal to 15% of the total costs under § 1530.3(b) (1) thru (6).

### § 1530.4 Billing procedures.

(a) The OFI will present the sponsoring companies with a bill within 30 calendar days of the end of each calendar-year quarter for reimbursable costs incurred over that quarter for that segment of ANGTS or other facilities determined to be related to ANGTS.

(b) The bill will include the following:

(1) Total OFI expenditures incurred for the quarter, broken down by object class per OFI office;
(2) A brief description of reimbursable activities undertaken for the quarter, broken down by OFI office;
(3) The percentage of reimbursable to non-reimbursable activities for that segment of ANGTS, broken down by OFI office; and
(4) A calculation of the reimbursement due for that quarter, computed by multiplying the total OFI expenditures, as per § 1530.4(b)(1), by the reimbursable percentage, as per § 1530.4(b)(3).

(c) The reimbursable percentage used in § 1530.4(b)(3) above is determined as follows:

(1) Prior to the commencement of each calendar year, the OFI will consult with the sponsoring companies to ascertain their project activities for the coming year, with special identification of activities requiring reimbursable OFI enforcement activities.

(2) The OFI will then determine the reimbursable percentage for each OFI office by project segment.

(i) That percentage will apply for the entire upcoming calendar year. It will not be adjusted unless extraordinary and unanticipated events materially and dramatically alter the OFI's reimbursable enforcement activities.

(ii) The OFI will determine that percentage based upon the following factors:

(A) Amount of Federal land to be crossed;
(B) Types of pre-construction or construction activities to be undertaken during that year;
(C) Proportionate amount of time each OFI office will need to monitor those activities; and
(D) Level of intensity for monitoring on Federal lands as opposed to non-Federal lands.

(3) If a sponsor company intends to contest any of the reimbursable percentages, it may not do so until, but must do so when, it receives its first quarterly bill for the calendar year at issue. It must then follow the procedures set out below in §§ 1530.5 and 1530.6.

### § 1530.5 Payment procedures.

(a) Payment of reimbursable costs should be made, as billed, to the OFI specifically identified for U.S. Treasury Account Number 2469.

(b) Payment should be made within 30 calendar days of receipt of billing.

(c) The sponsoring company making payment under this Section should simultaneously notify the OFI Director of Financial Management of that payment.

(d) If the sponsoring company contests any part of the bill, rendered pursuant to § 1530.4, it must nonetheless

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pay the uncontested balance, and then proceed under § 1530.6 immediately below.

§ 1530.6 Protest procedures.

(a) If and when a sponsoring company contests any part of an OFI bill, as per § 1530.5(d) immediately above, it shall act pursuant to this section.

(b) The contesting company must append to its partial payment a petition fully justifying its action, including the following items:

(1) A clear description of the contested amount, with detailed reference, by cost category and office, to the OFI bill;

(2) A full explanation of the legal basis for contesting payment; and

(3) Where relevant, a counterstatement of the facts at issue.

(c) In its sole discretion the OFI may orally or in writing request further support for the petition contesting reimbursement, including convening an informal conference to explore the matter further.

(d) After reviewing the petition, along with any further information, the OFI, through its Director of Administration, will rule on the petition within thirty calendar days, notifying the petitioner in writing of the decision.

(1) If the Director accepts the contesting company's position and thus grants the petition, the partial payment previously rendered under § 1530.5(d) will be deemed to satisfy fully the quarterly bill rendered under § 1530.4.

(2) If the Director rejects the contesting company's position and thus rejects the petition, the petitioner:

(i) Shall make payment of the contested and previously withheld amount within ten calendar days, and

(ii) May within five calendar days after payment appeal the Director's adverse finding to the Federal Inspector, pursuant to § 1530.6(e) immediately below.

(e) The Federal Inspector or designee will render a final decision on any appeal of the Director's adverse finding within sixty calendar days of receipt, unless the appellant has failed to make full payment to the OFI, as per § 1530.6(d)(2)(i).

(1) If the Federal Inspector or designee grants the appeal, the OFI will either return to the appellant the contested payment within thirty calendar days or credit the appellant's next quarterly bill.

(2) If the Federal Inspector denies the appeal, the appellant may institute appropriate judicial action to recover the contested payment.

(f) If and when a contesting company refuses to make full payment following the Director's adverse finding on its petition (in contravention of § 1530.6(d)(2)(i)), the OFI may stop work on any applications for regulatory approval submitted by the company and pending before the OFI under Reorganization Plan No. 1 of 1979. The schedule and cost consequences will be attributed to the noncompliant company.

(g) Notwithstanding § 1530.6 (a) thru (f) immediately above, the company making full payment of reimbursable costs may undertake the following:

(1) Within seventy-five calendar days of receipt of the OFI quarterly bill, as per § 1530.4, the company may request to conduct an audit of the bill.

(2) The company will complete that audit within ninety calendar days of the request and at its own expense.

(3) If, based on that audit, the company contests any part of the bill already paid and not previously contested, it may petition for the return of the contested payments pursuant to the procedures set forth above in §§ 1530.6 (b) thru (e), where appropriate.

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## CIVIL AERONAUTICS BOARD

### 14 CFR Part 204 and 291

[Economic Regulation Docket 38604; EDR-411]

### Data to Support Fitness Determinations and Domestic Cargo Transportation; Limitation on Fitness Determination

Dated: October 28, 1980.

**AGENCY:** Civil Aeronautics Board.

**ACTION:** Notice of Proposed Rulemaking.

**SUMMARY:** The CAB is proposing to impose a 2-year limit for starting service or continuing service after a fitness determination. Carriers that did not begin service or operate within that time period would be required to resubmit fitness data and obtain re-authorization before beginning service. This rulemaking is at the Board's own initiative.

**DATES:** Comments by: December 18, 1980.

Reply comments by: December 30, 1980.

Comments and other relevant information received after this date will be considered by the Board only to the extent practicable.

Requests to be put on the Service List by: November 18, 1980.

The Docket Section prepares the Service List and sends it to persons listed, who then serve their comments on others on the list.

**ADDRESSES:** Twenty copies of comments should be sent to Docket 38604, Civil Aeronautics Board, 1825 Connecticut Avenue, N.W., Washington, D.C. 20428. Individuals may submit their views as consumers without filing multiple copies. Copies may be examined in Room 711, Civil Aeronautics Board, 1825 Connecticut Avenue, N.W., Washington, D.C., as soon as they are received.

**FOR FURTHER INFORMATION CONTACT:** Terri Smith, Special Authorities Division, Bureau of Domestic Aviation, Civil Aeronautics Board, 1825 Connecticut Avenue, N.W., Washington, D.C. 20428; 202-673-5088.

**SUPPLEMENTARY INFORMATION:**

In this notice the Board is asking for public comment on a proposed rule to limit to 2 years the duration of a finding of fitness for nonoperating air carriers. Newly certificated passenger carriers, international cargo carriers, domestic all-cargo carriers, and commuter carriers proposing to serve an eligible point (as defined in section 419 of the Federal Aviation Act), that did not begin operations within 2 years after being found fit, willing and able by the Board, or that ceased operations for 2 years, would have to re-file, as applicable, the data in 14 CFR 204.5 (certificated carriers), 14 CFR 204.7 (Commuter carriers), or 14 CFR 291.11 (all-cargo carriers), before beginning or resuming service. The Board tentatively believes that this limitation is necessary to enable it to meet its obligations to assure continuing fitness of carriers under section 401(r) of the Act. The proposed rule would apply to those carriers that have not begun operation or have stopped operations at the time a final rule is made effective.

Under sections 401 and 419 of the Act, the Board is required to determine whether an applicant is fit, willing, and able to perform air transportation properly and to conform to the provisions of the Act, and to the rules, regulations, and requirements issued under it. The Board is also required to find a commuter carrier fit to provide service to an eligible point under section 419. The Board has adopted two rules that require these carrier applicants to submit data so that it can make determinations (14 CFR Parts 204 and 291). There are three areas that the Board examines to determine an applicant's fitness: 1) the applicant's managerial skills and technical ability, 2) its financial resources as related to its operating proposal, and 3) its compliance disposition. The data requirements in Parts 204 and 291 are based on the assumption that carriers will begin service relatively soon after

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### FISCAL YEAR 1982 EMPLOYMENT

Mr. YATES. What is your current employment level?

Mr. RHETT. 138. That is permanent full-time positions.

Mr. YATES. What do you expect the employment level to be at the end of fiscal year 1982?

Mr. RHETT. 1982? Probably up to about 168, if the project does not slow down more. Right now my hiring freeze is still on.

### RECRUITING DIFFICULTIES

Mr. YATES. Are you finding any difficulties in recruiting?

Mr. RHETT. Yes. But, fortunately, we also work through contract. Much of the highly specialized technical support is done by contractor or consultant. Since these people are needed for only short periods of time, we couldn't bring them in, and then let them go.

### ENVIRONMENTAL PROTECTION

Mr. YATES. You have to balance the completion of your project with protection of the environment, don't you?

Mr. RHETT. Yes.

Mr. YATES. That is kind of tough. How do you go about doing it?

Mr. RHETT. I personally think we are doing a pretty phenomenal job. I am convinced that if you isolate your environmental problems early, then the engineers can design the project to protect the environment during constuction.

Mr. YATES. What are you doing about the caribou?

Mr. Rhett. One thing we are fortunate about is our pipeline goes right next to Alyeska's. So, if there is a problem with caribou, it is Alyeska's problem.

Mr. YATES. I see. What is Alyeska doing about the caribou?

Mr. RHETT. Well, you know a number of studies lately have been very interesting. In some places where there are passovers, they find the caribou are using them. The caribou have been a lot less affected than I think was expected in the beginning.

Mr. YATES. Are you having any comparable problems with any other animals other than the caribou?

Mr. RHETT. No, not really. The real problem for the pipeline, I think, will be fish.

Mr. YATES. Oh, really? In what way?

Mr. RHETT. Well, we will be crossing quite a few streams. I think 10 percent of Alaska's income is based on fish. Also, you have a tremendous amount of subsistence fishing.

So, we have got to be careful, it is a delicate environment for fish to be in. So, we have got to be careful in the manner in which we cross the streams. There are over 600 streams.

Mr. YATES. Six hundred streams?

Mr. RHETT. Over 600.

Mr. YATES. All in Alaska?

Mr. RHETT. All in Alaska.

Mr. YATES. My goodness. What are the Canadians doing about it?

Mr. RHETT. They are doing much the same thing. The problems in the Yukon are very similar. The socio-economics, the subsistence, the weather, and the environment are all very similar.

### CITIZENS' ENVIRONMENTAL ADVISORY COMMITTEE

Mr. **Yates**. Are you proposing to establish a citizens' environmental advisory committee?

Mr. **Rhett**. Yes, as soon as there is definitely a project.

Mr. **Yates**. Do you know who you are going to put on it?

Mr. **Rhett**. I do not.

Mr. Yates. How will they function, from Washington, or up there?

Mr. **Rhett**. No, up there. They will be made up of people with Alaskan experience. They will report directly to me, and I will furnish them with staff. I personally think we can gain quite a bit from it.

### ATIGUN PASS CONSTRUCTION

Mr. **Yates**. Last year you talked about problems you had with Atigun Pass. Do you still have the problems?

Mr. **Rhett**. Yes, except I think there is agreement now among the oil pipeline owners, the State of Alaska and Northwest as to how to get across that pass. It is going to be a most difficult engineering feat. They also plan to do it one year in advance of the rest of the pipeline.

Mr. **Yates**. How are they going to do it? How wide is the pass?

Mr. **Rhett**. The pass is very, very narrow. But, we have a road going through it, the major road to Prudhoe. On one side of the road is the oil pipeline, on the other side is a pretty steep slope. To put another pipe in there with those soil conditions will be extremely difficult. I think the final solution will be to come over the steep slope side, and place the pipe there. It is going to mean a lot of earth moving. It is also going to be difficult to keep the road open, and the road has to be kept open.

Mr. **Yates**. Where is the pass located?

Mr. **Rhett**. On the map, it is about an inch down from Prudhoe Bay. You have the Brooks Range here, and this is the National Wildlife Preserve.

This is NPR, the National Petroleum Reserve. There were only a couple of places to cross when the oil pipeline was being built. One way was extremely expensive, so they came over Atigun. We also looked at the other routes, and came back to Atigun. It is better to come through the same corridor and deal with the difficulty of construction than to try to divert it elsewhere.

Mr. **Yates**. It can't go on top of the Alaska line, can it?

Mr. **Rhett**. No. Normally, we have a requirement that the gas pipeline stay 200 feet away from the oil pipeline unless they get my specific approval. We don't want a hole in that pipeline.

### YUKON RIVER CROSSING

Mr. **Yates**. What about the Yukon River crossing?

Mr. **Rhett**. With the Yukon River crossing, there is a similar problem. There are four ways of going across it. Two of them on the existing bridge. Another is putting in a new bridge, and the last one is to bury the pipe. The one that looks most likely now is placing the gasline on the bridge with the oil pipeline. It is by far the least expensive.

Mr. **Yates**. Will the bridge support both?

Mr. **Rhett**. The bridge will support both. Again, there are difficulties. People are concerned about having an oil pipeline and a gasline on the same bridge.

Mr. **Yates**. What if the bridge gave out?

Mr. **Rhett**. We lose two pipelines. That has always been the problem here—two pipelines and also a highway, which is your major way up to Prudhoe. A detailed risk analysis has been run, and there will be a meeting the first week of April in Seattle between the TAPS pipeline people and, well, really everybody involved, including the State of Alaska, to try to determine the best approach.

Mr. **Yates**. When do you expect to complete the analysis of the risks involved in placing the energy facilities on the same bridge? Have you done that already?

Mr. **Rhett**. The basic analysis has been finished. We are reviewing it now in preparation for this meeting in April which all interested parties will attend. The prime determinant will be the State of Alaska, since it owns the bridge.

### PREVENTION OF WELD PROBLEMS

Mr. **Yates**. You spoke about the welds being a problem. I guess that was a problem with Alyeska too. What are you doing to avoid this in the future?

Mr. **Rhett**. We have a quality assurance and quality control system, so that we are not having the same troubles that Alyeska had.

If you remember, on the oil pipeline, part of the problem was concealment; things that should have been done were just not being done. Our problem is a technical problem, and we are investigating it. The quality of the pipe metal is getting higher.

### PIPE VENDORS

Mr. **Yates**. Where are you buying the pipe from?

Mr. **Rhett**. Well, the bulk of the pipe today has been from the U.S. 100 percent of the pipe for the western leg was made in the U.S., and 61 percent for the eastern leg. A little bit came from Japan, a little bit from Italy. And the pipe has been bought at generally competitive prices. The steel companies were competitive.

Mr. **Yates**. Who is doing the buying, the private companies?

Mr. **Rhett**. The private companies.

### WELD AUDITS

Mr. **Yates**. What percentage of the welds are you going to audit?

Mr. **Rhett**. Let me explain the total system. The X-ray contractor checks 100 percent of the welds; then the sponsor's quality control system checks 100 percent of them. Then the sponsor's quality assurance spot checks this work to assure that these people are doing it right. Then we spot check them to make sure they are doing it right.

Mr. **Yates**. How much of a spot?

Mr. **Rhett**. Our spot checking may be 1 percent or less. In fact, less, because we are looking at a system rather than a weld. We are going in to see that the system was set up properly. During this process, we picked up technical problems, which means the system is working. So, the welding problem is not a problem of finding them. It is a technical problem with using heavier pipe, higher quality pipe than we have normally worked with in the United States. This means that the procedures and the training for the checking programs are all going to have to be set up properly.

Mr. **Yates**. Who is your expert on welding? The gas will be under more pressure. The pipe is going to be thicker, so the welds will have to be much, much stronger than the welds in the other pipeline, won't they?

Mr. **Rhett**. Yes, but the difficulty is when you get into higher quality and heavier metals, there is a tendency, either through the chemistry, the methodology, or the the handling to have defects show up. These defects are not permitted. So any defects have to be corrected. Now, Northwest and a number of the companies are putting quite a bit of money into a series of studies to see if the codes should be changed for Alaska.

Mr. **Yates**. How does that figure into your time computations?

Mr. **Rhett**. Well, when we were on our original schedule, we weren't going to make it. If we keep slipping, we are going to make it. I think with this last slip, we should have the results in time to be able to make changes.

Mr. **Yates**. Keep us advised.

## ORGANIZATION AND MANAGEMENT

You talk about refining your organizational structure and management system.

Would you put in the record some examples of what you mean by that?

Mr. **Rhett**. I sure will.

[The information follows:]

### Refinements in Agency Systems

The Office of the Federal Inspector itself was created to stimulate greater efficiency in and better management of the Federal regulatory process for projects of this nature. Since the Office of the Federal Inspector was first formed, several organizational changes have been instituted to improve the efficiency and responsiveness of the agency. We have established cleaner functional groupings of our field, technical and administrative units to better distribute workload and avoid overlapping efforts. Thus, one Deputy Federal Inspector is responsible for all headquarters activities, and lower 48 construction, while the other is charged with overseeing the engineering, environment and Alaska field offices. Furthermore, our field offices have been established near the pipeline route or major centers of sponsor activity, to ensure both effective oversight and prompt interchange of information.

The agency has implemented several management initiatives to improve the quality of internal and external services. For example, we have instituted a variety of reporting systems as well as quarterly management meetings to assure proper coordination and adequate flow of information among all OFI offices. A comprehensive planning system also aids in this process, by requiring each office to submit detailed workload estimates for a 2-year planning cycle. Included within the workplans are studies to evaluate both the performance of the sponsor and the OFI.

After the planning input is synthesized, it becomes the framework for all agency operations. As a result, workload is better defined and coordinated, which enhances the overall efficiency and effectiveness of agency activities. In addition, a directives manual referencing agency policies and procedures on a variety of issues further helps standardize and systematize daily operations, thereby reducing confusion and waste. And, to assure that all agency activities are properly documented for future reference, the OFI has, in the last several months, revamped its records management system. Control over the flow of agency documents has now been centralized, with flexible procedures instituted for all field offices to maintain the integrity of their records.

Several automated systems have been set up to support the management of certain internal operations, such as travel and financial reporting. Two computerized travel systems were developed to enable more efficient use and scheduling of trips and more timely and accurate reporting of trips. Both are simple to administer and inexpensive to operate. Our monthly travel schedule allows us to monitor staff travel to better coordinate office meetings and work assignments. Our quarterly travel report generates a variety of information, which is helpful for planning and budgeting purposes. The types of information provided include: individual travel costs, complete records of individual trips, and audits of voucher processing times. Standard reports provide data on the frequency of travel according to duty station and division, and computations of average and cumulative costs.

Certain refinements have been made in the management of our responsibilities for overseeing project activities. A compliance manual was developed to provide our field inspectors with standardized and consistent enforcement guidelines for lower 48 construction, and later, for the Alaskan Leg. This effort is intended to minimize disputes and, thus, costly delays in the construction of the system.

Wherever possible, the OFI has also used other Federal agency expertise, through Memoranda of Understanding, to eliminate duplication of effort, and thereby reduce costs. Our organization is thus kept to the minimum of full-time permanent government staff necessary to get the job done well. Our utilization of other Federal talent is enhanced by the presence of Agency Authorized Officers (AAOs), or those who have been appointed as liaisons for their agency during this project. For example, both the AAOs for the Department of Transportation and the Environmental Protection Agency are colocated with OFI staff to advise and assist us on a variety of technical and environmental issues. Quarterly meetings of the Executive Policy Board, which is composed of representatives from eight Federal agencies, allow for a full exchange of management and policy information, and further improves upon coordination at the Federal level. The OFI has also made it a standard operating policy to employ contractor support for highly specialized technical work where Government expertise is in short supply. This approach is the most efficient use of Government funding, since it is extremely costly to hire technical experts as full-time Government workers when the project is of a limited duration.

The experimental nature of the agency itself has also presented opportunities for improved project management. For example, since the OFI has become the focal point for Federal oversight of this project, the entire Federal permit issuance process has been simplified, resulting in reduced costs for both Govenment and industry. The sponsor company need only apply to the OFI for permits, instead of several different agencies simultaneously. Further, the OFI ensures that the permits are issued in a timely fashion. To this end, we have developed a computerized tracking system to monitor the timeliness with which a permit is processed, to identify early on those permits needing special attention, and to ensure that permits being issued do not contain conflicting stipulations. These OFI initiatives help avoid delays in permitting, and, thus, delays in preconstruction and construction activities. And, when construction stays on schedule, a major cause of cost overruns is eliminated.

Another area where the OFI has sought to improve the efficiency of its oversight of the project is cost control. Under the President's *Decision*, the sponsor must have management and cost control systems that meet OFI's approval. Since the OFI evaluates the effectiveness of the sponsors' systems during the development and operational stages, through its approval process, then we can, in turn, safely rely on the products of those systems to conduct our own cost analyses. This measure results in considerable cost savings, since the OFI does not have to set up and operate its own system to monitor costs.

### COST SAVINGS ARISING FROM REFINEMENTS

Mr. YATES. Are you having any cost savings as a result of your refinements?

Mr. **Rhett**. Oh, I think very much so. Since we started from zero, we can institute these systems as we go along. We have cost avoidance by putting in what I think is top flight management systems.

### FIELD SURVEILLANCE OF EQUAL EMPLOYMENT OPPORTUNITY AND MINORITY BUSINESS ENTERPRISE

Mr. **Yates**. Let's talk about field surveillance. How much of your field surveillance activity is devoted to equal employment opportunity and minority business enterprise?

Mr. **Rhett**. Well, I have six full-time staffers assigned to this function. Of course, my managers, wherever they are, are also responsible for it. I might add that in this particular area, Mr. Cook, who oversees the lower-48 legs, and myself, have spent a lot of time on it.

As you well know, it is a very complex and complicated problem with projects of this magnitude.

### FIELD ACTIVITIES FOR THE ALASKAN AND EASTERN LEGS

Mr. **Yates**. How do you break down your field surveillance? How much for Alaska and how much for the eastern leg?

Mr. **Rhett**. On the eastern leg we have 11 people. There are 29 people in Alaska, but that includes both my Deputy for Alaska, who also runs Irvine, and my Chief of Environment, who is responsible for all three legs.

In Alaska, they are doing some pre-construction work now.

Mr. **Yates**. How often do those field teams visit construction sites?

Mr. **Rhett**. They are there all the time. I mean that they watch almost 100 percent of the critical operations.

### OFFICE SPACE RENTAL COSTS

Mr. **Yates**. Your justification shows a large increase in per square foot rental costs in 1983. What caused the jump from $10 to $23 per square foot? Was this GSA?

Mr. **Rhett**. It was GSA.

Mr. **Yates**. We ought to investigate GSA then, shouldn't we?

Mr. **Rhett**. They are tough landlords.

Mr. **Yates**. Does that rental request include space in San Francisco, too?

Mr. **Rhett**. No. San Francisco is out. We are shutting that office down.

Mr. **Yates**. That assumes your Washington office will be open all year?

Mr. **Rhett**. Yes.

### OTHER SERVICES COSTS

Mr. **Yates**. Would you put in the record the same breakout for "other services" for fiscal years 1981 and 1982 that you have for 1983?

Mr. **Rhett**. Yes.

[The information follows:]

### OTHER SERVICES ESTIMATE

[Fiscal year 1981–82]

| Category | 1981 actual | 1982[1] estimated |
|---|---|---|
| Pipeline design review and surveillance | $5,300,000 | $6,200,000 |
| ADP operations | 760,000 | 2,500,000 |
| Field logistics and transportation | 505,000 | 1,800,000 |
| Audit support | 2,216,000 | 1,500,000 |
| EEO compliance monitoring | | 300,000 |
| Interagency agreements | 1,211,000 | 800,000 |
| Special and technical studies | 31,000 | 700,000 |
| Other administrative support services | 495,000 | 800,000 |
| Total (rounded) | 10,518,000 | 14,600,000 |

[1] The fiscal year 1982 estimates, as discussed previously, are subject to some downward adjustments, pending the completion of our analysis of the effects on our fiscal year 1982 budget of the construction schedule slippage to a winter 1987–88 date.

### AIRCRAFT LEASING

Mr. **Yates**. How much of the request for field logistics and travel is for lease or chartering of aircraft?

Mr. **Trent**. That total is $1.6 million.

Mr. **Yates**. $1.6 million?

Mr. **Trent**. For all of the travel.

Mr. **Rhett**. How much for charter?

Mr. **Trent**. The amount for charter——

Mr. **Rhett**. Maybe we better furnish that for the record.

[The information follows:]

### Estimated Aircraft Charter Costs

Of the $1.6 million, approximately $600,000 is slated for contractual air charters during fiscal year 1983.

### USE OF INTERIOR'S OFFICE OF AIRCRAFT SERVICES

Mr. **Yates**. Are you going to use the Department of the Interior's Office of Aircraft Services?

Mr. **Rhett**. Yes.

Mr. **Yates**. Do you have to pay them?

Mr. **Rhett**. Yes. You know, they have done a tremendous job for us.

Mr. **Yates**. I know, it is a good outfit.

Mr. **Rhett**. And saved me a heck of a lot of money.

Mr. **Yates**. Yes. Would you put in the record whatever you have found to be more reasonable, the cost of purchasing, or leasing aircraft? Would it be cheaper for you to buy an aircraft, or to lease it? Or haven't you studied that?

Mr. **Rhett**. Only a cursory study—in the beginning. I do not believe it is applicable to us because we are too small. I would like to own part of a plane Interior already has there, but our Agency needs such varied aircraft it wouldn't make sense. We use charter craft primarily for surveying the line, and one day we may need a helicopter, the next, a fixed wing aircraft.

Mr. **Yates**. Do you have any trouble getting the appropriate craft from Interior?

Mr. **Rhett**. No.

Mr. **Yates**. Okay.

## INTERAGENCY SUPPORT

Would you put in the record any interagency agreements you expect to have in 1983.

Mr. **Rhett**. Yes.

[The information follows:]

### Interagency Agreements for Fiscal Year 1983

The Federal agencies with which the OFI expects to have interagency agreements in fiscal year 1983 include the U.S. Army's Corps of Engineers; the Department of Interior's Bureau of Land Management, National Park Service, Geological Survey and and Office of Aircraft Services; the General Services Administration; and the Environmental Protection Agency.

## INTERIOR SUPPORT FOR FIELD ENFORCEMENT

Mr. **Yates**. Does Interior give you any help in enforcing field enforcement activities?

Mr. **Rhett**. Yes. In fact, we are right now negotiating a Memorandum of Understanding with Interior on divisions of responsibility. We will reimburse them for some of those activities.

## REVIEW OF CONSTRUCTION COST ESTIMATES

Mr. **Yates**. Do you check to see whether the pipeline constructors' estimates of cost are valid?

Mr. **Rhett**. Yes.

Mr. **Yates**. You do. That is important, because their return depends on it, doesn't it?

Mr. **Rhett**. Yes.

Mr. **Yates**. How careful are you in that?

Mr. **Rhett**. There is probably no other area where we have been more under the gun and have had to use more professional expertise than in the certification cost estimate review, which we are doing together with FERC. The effort here is extremely high and extremely important. This involves what could be billions of dollars of savings to the consumer over long periods of time.

Mr. **Yates**. How do you do that; what procedures have you instituted to make sure that you are not being overcharged?

Mr. **Rhett**. I have an engineering force in Irvine, and have also contracted with Williams Brothers Engineering to do some of the work.

So, between the contractor and my engineering force, the sponsors' detailed estimates are being analyzed and debated.

Mr. **Yates**. Would it be useful to have GAO take a look at it; to make sure it is being run properly?

Mr. **Rhett**. I personally don't think so. In the first place, it is a highly specialized, technical——

Mr. **Yates**. That is right. But it is comparable to the validation of costs associated to a utility rate setting.

Mr. **Rhett**. Yes.

Mr. YATES. I think GAO has had the opportunity to look at that in the past. Now, I know it is a very complicated, technical and a long procedure; and I think it is easier at the start than it is at the conclusion. However, that is something the committee might want to consider.

Mr. RHETT. Well, I will also do some checking.

Mr. YATES. Sure.

Mr. RHETT. It is such a specialized field, that I do not know how it could be done without hiring another Williams Brothers.

### MEMORANDA OF UNDERSTANDING

Mr. YATES. You have a Memorandum of Understanding with other Federal agencies to carry out enforcement authorities. Do you maintain any element of control over those agencies?

Mr. RHETT. Oh yes.

Mr. YATES. You do?

Mr. RHETT. They report to us and we pay them.

Mr. YATES. Are they performing well?

Mr. RHETT. Yes. We have had very, very good relationships.

Mr. YATES. Which agencies are they?

Mr. RHETT. Primarily it has been BLM. We have also, on the western leg, used the Department of Agriculture's Forest Service quite extensively.

### PERMIT PROCESSING

Mr. YATES. Can you estimate the number of permits that will have to be processed during the next fiscal year, and how that number compares to 1982? I think you can put that in the record.

Mr. RHETT. Yes, please.

[The information follows:]

### NUMBER OF PERMITS PROCESSED IN FISCAL YEAR 1982-83

With the recently announced slip in the project construction schedule to a 1987-88 completion date, the original estimates of the number of permits to be processed in fiscal year 1982 and fiscal year 1983 have been scaled back. Under the revised schedule, approximately 142 permits will now be processed in fiscal year 1982, and an estimated 700 permits in fiscal year 1983.

### POSSIBLE COST SAVINGS

Mr. YATES. Here is a question that appeals to your conscience. Can you estimate the cost savings on the gas pipeline which are a result of your having been appointed, as compared to what happened on the oil pipeline? Do you think there have been any savings as a result of your appointment?

Mr. RHETT. I don't believe we would be anywhere near where we are. That is because, Mr. Chairman, there is a central focus with the OFI. Conflicting decisions by different agencies will not occur.

Mr. YATES. Why don't you put a couple of paragraphs in the record for us.

Mr. RHETT. All right. Our oversight requires looking at all facets of the project.

Mr. YATES. In other words we should have had a Federal Inspector for TAPS, too?

Mr. **Rhett**. Yes.

[The information follows:]

### COST SAVINGS RESULTING FROM THE EXISTENCE OF A FEDERAL INSPECTOR

The impetus for creation of the Office of the Federal Inspector (OFI) grew directly out of the Trans-Alaskan Pipeline System (TAPS) experience. Evaluation of the TAPS record indicated the existence of delays and inconsistencies in the Federal regulatory process. Reorganization Plan No. 1 of 1979, which transferred certain Federal enforcement authorities to the OFI, was specifically intended to stimulate greater efficiency and more predictability in Federal enforcement, with subsequent cost savings in the form of reduced project costs. To some extent, it will also reduce Federal expenditures associated with the improved efficiency of the enforcement of Federal regulations.

The establishment of the OFI is resulting in some cost savings since it minimizes duplication among Federal agencies. Because OFI's responsibilities encompass all facets of the project from the planning and design phases through construction and initial operation, consistency and continuity will be maintained. The comprehensive nature of our oversight, combined with policies, procedures and systems we have developed to carry out our responsibilities, assure that Federal as well as project costs will be minimized or even reduced. For example, significant cost savings can be expected during the permitting phase of the project, not only because the OFI is the focal point for Federal activities, but also because the systems the OFI had designed to implement its permitting oversight promote efficiency. That the sponsors need only apply to the OFI, instead of several different agencies for permits, saves time and money. Furthermore, the OFI has instituted computerized systems to monitor the timeliness of issuances, to identify earlier or scheduling conflicts and/or permits requiring special attention, and to help resolve any conflicts in stipulations attached to the permits being issued. As an efficient clearinghouse for all Federal permits, the OFI acts to prevent any delays in the construction schedule, and, in effect, helps remove the threat of project cost overruns.

Our responsibiliy for overseeing project costs to assure that they are prudent and can be included in the rate base has also been translated into a management approach that means a reduction in direct Federal costs. The OFI has been charged with evaluating and approving the design and operation of the systems the sponsors will use to control costs and manage project activities in general. We also have responsibility for reviewing cost estimates, auditing expenditures, and determining the purdency of costs. Instead of developing our own, separate cost control system to parallel the sponsors', we are utilizing their systems to conduct our required cost analysis work, since we will have already verified the effectiveness and efficiency of their systems. This in turn means considerable savings to the Government.

In addition, the OFI has made and will continue to make a concerted effort to use existing Federal expertise through interagency agreements. These agreements allow the OFI to utilize these agencies' expertise without detracting from OFI's project responsibilities or decisionmaking authority, and contribute to lower Federal operating costs in general. In the same vein, the OFI will continue to use contractor support for highly specialized technical work. To hire technical experts as fulltime permanent government workers would be costly and inefficient, since the project is of such limited duration. The use of both available Federal talent and contract support serves to keep Federal Government's lifetime costs for the oversight of this project to the minimum necessary to get the job done well.

At this point, it is not possible to quantify the project cost savings that will ultimately be realized. However, given the magnitude and complexity of the project and the substantial impact construction delays would have on costs, the improved direction, oversight and efficiency resulting from the creation of the OFI should provide the potential for the sponsors to reduce the total costs over the life of the project. These savings would then directly translate into lower gas bills for the consumers of Alaskan gas.

### ADDITIONAL QUESTIONS FOR THE RECORD

Mr. **Yates**. Okay, there are some questions we have that should be answered for the record.

[The information follows:]

## ADDITIONAL COMMITTEE QUESTIONS

### Increase in Other Services Costs from 1981 to 1982

Question: Please explain the $4.0 million increase in other services from the FY 1981 actual to the FY 1982 estimate (page 24).

Answer: The $4,000,000 increase resulted from a budget process that was geared to a winter 1986-87 completion schedule for the project. It represented a net increase in a variety of contract services expected to be utilized by the Office of the Federal Inspector. Now that the schedule has been revised to a later completion date of winter 1987-88, the estimated amount of contract services in FY 1982 is likely to be substantially decreased, to reflect the slower pace of project activity until construction gets underway in Alaska.

Originally, though, increases were planned in the level of support for pipeline design review and logistics requirements both for prebuild construction and increasing preconstruction utilities in Alaska. ADP operation costs were expected to increase as the full scale implementation of the Federal Inspector Management Information System (FIMIS) got underway. Other major contract services were expected to drop from 1981 to 1982. Specifically, the estimates for the cost and audit area and interagency agreements dropped to lower levels in FY 1982 as the certification cost estimate for the Alaskan Leg was wrapped up, and special, one-time studies conducted under interagency agreements were completed.

## OFI Audit Functions and Contract Support

Question: Resources for your audit function is estimated at $2,982,000 in FY 1983. This includes 13 Federal employees and $1,500,000 in contract support. How does contractor audit support augment the Federal staff?

Answer: In July 1981 Main Hurdman, a major public accounting firm, was awarded the audit support service contract. Quarterly audits are conducted by the contractor of sponsor-claimed costs to determine whether they are properly assignable to the project and are of a nature that should qualify them for eventual inclusion in the rate base. Further, an opinion is expressed by the contractor as to whether the sponsor is in compliance, in all material respects, with the applicable accounting and reporting regulations and certain other requirements which the Federal Inspector was given the responsibility to enforce. This Main Hurdman rate base audit supplants the use of a Government staff, thereby minimizing OFI audit staffing. During construction the audit also includes an examination and evaluation of selected functions of designated management cost control systems as approved by the Office of the Federal Inspector.

Question: How is the work distributed between the Federal and contractor staff?

Answer: The Main Hurdman staff performs the contract audits as specified and issues the required quarterly reports to the Director, Office of Audit and Cost Analysis. OFI auditors perform all of the necessary sponsor coordination, such as obtaining the quarterly rate base application; ensuring the availability of pertinent records for auditing; administering the OFI audit contract technical provisions; and advising the Federal Inspector and other OFI staff concerning audit issues. The audit staff also drafts the Director's tentative rate base determinations, and reviews and evaluates public comments on the tentative determinations.

Question: How do you assure there are no conflicts of interest with the contractor staff?

Answer: The contract pre-award process required the contractor to attest to any present or planned interests which could be considered a possible conflict. This statement was then examined by the OFI staff. Main Hurdman had no such conflicts. The awarded contract includes specific provisions regarding: the reporting of any new or potential conflicts; the flow down of the conflict requirement to all subcontractors; the disqualification of any employee having a conflict; and necessity for future avoidance of any real or apparent conflicts. It should also be noted that the American Institute of Certified Public Accountants (AICPA) Professional Standards, Volume 2--Ethics, Bylaws, Quality Control, addresses the necessity for auditor independence that would also cover conflicts of interest. Main Hurdman has established in-house procedures designed to adhere to the stated AICPA code.

Question: Have you stayed current with the audit of construction costs on the Eastern Leg?

Answer: The status of the audits is shown below:

| Rate Base Cost Period | Audit Completion Date | Report/Determination Status |
|---|---|---|
| Calendar Year 1980 | FERC audit completed mid-1981. Final report submitted to OFI January 13, 1982. | Draft determination under staff review |
| January 1 - July 1, 1981 | December 31, 1981 | |
| July 1 - October 1, 1981 | February 18, 1982 | Report under staff review |
| October 1 - December 31, 1981 | Target date is May 15, 1982 | ------ |

FERC performed the 1980 audit for OFI in accordance with a Memorandum of Understanding. The 1981 audits were performed by Main Hurdman in accordance with the OFI audit contract.

Question: Have you uncovered any significant problems with the Eastern Leg?

Answer: The audits disclosed a number of things commonly found in rate base audits. For example, the sponsor included certain amounts related to public relations, celebrations, and lobbying in their submittals which may not be allowable in rate base. Similar findings were disclosed in an audit of pre-1980 expenditures performed by FERC auditors on which a Commission decision is pending. OFI's final determination on these items will be deferred until a FERC determination on the earlier expenditure is made. Additional information is required on engineering and related services before an opinion can be expressed on these amounts. Discussions are underway with the sponsor to resolve this issue.

Question: Do you now expect the Eastern Leg to be finished under the proposed budget?

Answer: Yes. While certain remedial welding work and other costs have yet to be factored into the forecasts, such additional costs are not expected to exceed the proposed budgets.

### GENERAL PROBLEMS

Mr. YATES. Do you have any problems you haven't told us about that we ought to know about?

Mr. RHETT. No, I really don't believe so. Nothing that $40 billion or $30 or $20 billion, wouldn't solve.

### ESTIMATED COST OF GAS

Mr. YATES. What is your estimate as to how much the consumer in Chicago, for example, is going to have to pay for gas?

Mr. RHETT. In 1981 dollars, it will average out to about $4.50 to $5.00 over 20 years.

Mr. YATES. What is the cost now?

Mr. RHETT. Gas today varies from as high as $9.50, which is for deep gas. I think the average price of gas is about $3.00.

Mr. YATES. Didn't I read about some estimates, perhaps it was in congressional debate, there were some estimates made that the gas was going to cost some outrageous sum?

Mr. RHETT. Yes, but those estimates were in inflated dollars.

Mr. YATES. Sure.

Mr. RHETT. The reason for the confusion is, if there are high inflation and interest rates, the costs become high. What nobody considered at the time, was what a barrel of oil would cost under the same assumptions.

Mr. YATES. I think they are more interested in what the cost of the gas coming out of the gasline will be.

Mr. RHETT. But I mean that, with inflation, the price of oil is going up and so is the price of gas. When somebody says it is going to cost $10, that is $10 in 1987 or 1988 dollars.

Mr. YATES. Is that the highest amount you think it will cost?

Mr. RHETT. That will depend on the inflation rate. The initial figures that were submitted up here were based on borrowing money at 14 percent and on inflation at 11 percent. Those were the figures being assumed. Now, the inflation rate looks like it is going to be considerably lower.

Mr. YATES. Well, we still ought to be interested in alternate sources of supply, shouldn't we?

Mr. RHETT. Yes, and in a sense that is what this is. This is an alternative source of supply.

Mr. YATES. This is correct? It is expensive.

Mr. RHETT. The one thing about the gasline is every year the gas gets cheaper.

Mr. YATES. Really?

Mr. RHETT. Yes, because of the depreciation system, it goes down. While the new price of energy, if you have any inflation, and I am sure there will be some, will continue to climb.

Mr. YATES. I saw a documentary the other night in which the manufacturers of oil from Garvey's in Manchester, England said they thought they could make a barrel of oil for $4. You don't want to comment on that?

Mr. RHETT. I have seen a lot of these.

Mr. YATES. All right, Mr. Rhett. Thank you very much. I appreciate your statement.

Mr. RHETT. I appreciate the opportunity.

Mr. YATES. Thank you.

WEDNESDAY, MARCH 24, 1982.

# UNITED STATES SYNTHETIC FUELS CORPORATION

## WITNESSES

**EDWARD E. NOBLE, CHAIRMAN OF THE BOARD**

**VICTOR A. SCHROEDER, PRESIDENT AND CHIEF OPERATING OFFICER**

**DWIGHT INK, VICE PRESIDENT, ADMINISTRATION**

**LEONARD AXELROD, VICE PRESIDENT, TECHNOLOGY AND ENGINEERING**

## OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order.

Today we are going to hear testimony presented by the United States Synthetic Fuel Corporation, here on behalf of the Corporation is its Chairman of the Board, Mr. Ed Noble, President and Chief Operating Officer, Victor Schroeder and Dwight Ink, Vice President in charge of Administration.

All the biographies and the biographic data sheet may go into the record at this point.

[The biography of Edward Noble follows:]

United States
Synthetic Fuels Corporation

## BIOGRAPHICAL DATA SHEET

Edward E. Noble: Born: March 19, 1928. Residence: Tulsa, Oklahoma. Political affiliation: Republican. Term: seven years. Chairman of the board, Noble Inns Corporation. Director, Auto Crane Company of Tulsa, Oklahoma. Previous director of Noble Affiliates, an oil-related company. Director of the Hoover Institute and Trustee of the Samuel Roberts Noble Foundation, Inc. of Ardmore, Oklahoma. University of Oklahoma, 1951. SFC position: Chairman of the board. Confirmed: May 14, 1981.

Victor Schroeder: Born: July 29, 1921. Residence: Atlanta, Georgia. Political affiliation: Independent. Term: six years. Manager of development for the Atlanta Apparel Mart and executive director of the Peachtree Center for three years. Past president and chief executive officer of Aplomb, Inc., a real estate consulting firm. Also served as senior vice president for development of the Phipps Land Company and president of Resort Properties. Attended Oklahoma State University and was graduated from Officer Candidate School at Fort Benning, Georgia. SFC position: President and board member. Confirmed: September 11, 1981.

C. Howard Wilkins: Born: February 19, 1938. Residence: Wichita, Kansas. Political affiliation: Republican. Term: five years. Founder and managing partner of the Maverick Company. Former president of the Pizza Huts of Louisville, Inc. and later president and chairman of the board of Pizza Corporation of America. Served as vice chairman of the board of the Pizza Huts, Inc. Yale University, 1960. SFC position: board member. Confirmed: September 11, 1981.

V. M. Thompson, Jr.: Born: November 12, 1924. Residence: Tulsa, Oklahoma. Political affiliation: Democrat. Term: four years. Chairman and chief executive officer of Utica National Bank & Trust and Utica Bankshares Corporation of Tulsa. Previously president and chief executive officer of First National Bank and Trust of Stillwater. Former director of Oklahoma City Branch of the Federal Reserve Bank of Kansas City. University of Oklahoma, 1948. SFC position: board member. Confirmed: September 11, 1981.

Robert A. G. Monks: Born: Decmeber 4, 1933. Residence: Boston, Massachusetts. Political affiliation: Republican. Term: three years. Since 1975 served as chairman of the board of the Boston Company; Inc. Also former president of the Maine Wood Fuel Company, Ram and Company and C. H. Sprague and Son Company. Held directorships with several coal companies, including Westmoreland, Imperial Smokeless, Winding Gulf and Penn-Virginia. Harvard College, 1954. Harvard Law, 1958. SFC position: board member. Confirmed: September 11, 1981.

2/10/82

United States
Synthetic Fuels Corporation **BIOGRAPHICAL DATA**

TE: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.

NAME AND TITLE: Ralph L. Bayrer, Deputy Vice President for Projects

EMPLOYMENT HISTORY:
(Employers, Dates, Titles)

U.S. Department of Energy (October 1977 - November 1980) - Director of the office of Policy, Planning and Analysis Resource Applications

U.S. Energy Research and Development Administration (February 1975 - September 1977)
- Executive Assistant to the Acting Administrator
- Assistant Director for Special Projects

McKinsey and Company (April 1968 - February 1975) - Senior Associate

U.S. Department of the Navy (July 1966 - February 1968) - Nuclear Engineer

U.S. Navy (July 1962 - June 1966) - Officer

EDUCATION: Cornell University (1957 - 1962) - Bachelor of Engineering Physics
Georgetown University (1962 - 1968) - Master of Science (Physics)
Bettis Reactor Engineering School (1963 - 1964) - Certificate

ACHIEVEMENTS/AWARDS:

RELEVANT PUBLICATIONS:

PROFESSIONAL AFFILIATIONS:

RSONAL:

United States Synthetic Fuels Corporation **BIOGRAPHICAL DATA**

NOTE: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.

NAME AND TITLE: Charles A. Cowan, Jr. - Vice President for Projects

EMPLOYMENT HISTOR :
(Employers, Dates, Titles)

1958-1979

Self-employed - Real Estate Development and Construction. Developed and constructed
500 single-family homes
2 million square feet of manufacturing and warehousing facilities
750,000 square feet of shopping centers

Golf Course

Housing subdivisions totalling 1,500 lots, including all necessary facilities and amenities

Acted as a consultant on various contracts.

| | |
|---|---|
| 1979-1980 | John Portman & Associates - Atlanta Merchandise Mart, Atlanta, Ga.<br>Supervised the demolition and reconstruction of approximately 500,000 square feet of floor space, involving the relocation of 379 tenants. |
| 1980-1981 | John Portman & Associates - Peachtree Center Management Company - Consultant |

EDUCATION: Graduated in 1956 from Georgia Institute of Technology with a B.S. degree in Industrial Management

ACHIEVEMENTS/AWARDS:

RELEVANT PUBLICATIONS:

PROFESSIONAL AFFILIATIONS: Project Management Institute

PERSONAL: Active in cattle raising

United States Synthetic Fuels Corporation **BIOGRAPHICAL DATA**

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**NAME AND TITLE:** EDWARD F. COX, GENERAL COUNSEL AND SECRETARY

**EMPLOYMENT HISTORY:**
**(Employers, Dates, Titles)**

| | |
|---|---|
| October 28, 1981 - Present: | General Counsel and Secretary<br>U.S. Synthetic Fuels Corporation |
| June - October, 1981: | Acting Deputy General Counsel<br>U.S. Synthetic Fuels Corporation |
| 1973 - June, 1981: | Cravath, Swaine & Moore, New York, N.Y.<br>Specializing in SEC and corporate law |

**EDUCATION:**

Princeton University '68 A.B.
Woodrow Wilson School of Public and International Affairs
Harvard Law School '72 J.D.

**ACHIEVEMENTS/AWARDS:**

**RELEVANT PUBLICATIONS:**

The Nader Report on the Federal Trade Commission (Baron Press, 1970).
Miscellaneous articles in The New Republic.

**PROFESSIONAL AFFILIATIONS:**

**SONAL:**

United States Synthetic Fuels Corporation **BIOGRAPHICAL DATA**

**NOTE: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.**

**NAME AND TITLE:** NEIL A. EISNER, Vice President for Finance (Acting)

**EMPLOYMENT HISTORY:**
**(Employers, Dates, Titles)**

| | |
|---|---|
| 10/81 - Present - | United States Synthetic Fuels Corporation<br>Vice President for Finance (Acting) - from 6/81<br>Assistant Vice President, Project Development |
| 1976 - 1981 - | Lehman Brothers Kuhn Loeb Incorporated<br>Senior Associate |
| 1975 - 1976 - | White Weld & Company, Inc.<br>Vice President |
| 1972 - 1975 - | L.F. Rothschild & Company<br>Manager |
| 1970 - 1972 - | The Chase Manhattan Bank<br>Second Vice President |

**EDUCATION:**
1964 - Doctors of Laws, Cornell University
1961 - Bachelor of Electrical Engineering,
Cornell University, National Merit Scholarship

**ACHIEVEMENTS/AWARDS:** $300 million transaction which qualified as largest financing of 1977

**RELEVANT PUBLICATIONS:** "Synthetic Fuels Plants - Risk Assessment and Financial Assistance Under the U.S. Synthetic Fuels Act of 1980" at Gov't Institutes, Roslyn, Va. - 18 Nov. 1981; "The Role of the U.S. Synthetic Fuels Corp. - in Developing an Industry" at American Institute of Chemical Engineers, Orlando, Fla. - 2 March 1982; (Please see attached)

**PROFESSIONAL AFFILIATIONS:**
Member of the Bar of the State of New York

**PERSONAL:**
Born 4/22/38 at Topeka, Kansas; raised in Virginia and New York. Married, two children. Live in N.W. Washington, D.C.

**RELEVANT PUBLICATIONS**

"An Approach to Risk and Financial Assistance in Energy Project Financing" at 2nd Hudson Institute Synfuels Conference Non-Conventional Financing of Synthetic Fuels, New York City - 19 May 1981; "An Approach to Risk and Financial Assistance in Energy Project Financing" at Energy Law 1981 International Bar Association, Banff, Alberta, Canada - 30 April 1981.

United States
Synthetic Fuels Corporation **BIOGRAPHICAL DATA**

**NOTE: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.**

**NAME AND TITLE:** Darrel W. Lundquist
Director of Planning

**EMPLOYMENT HISTORY.**
**(Employers, Dates, Titles)**

| | |
|---|---|
| 1979-1981 | Associate Director of Total Force and Interagency Mobilization Planning<br>Office of the Deputy Assistant Secretary of Defense (Program Management)<br>Chairman of the Interagency Mobilization Research Support Group<br>Executive Secretary of the Joint Department of Defense-Federal Emergency Management Agency Interface Working Group<br>Reserve Force Advisor to the Deputy Assistant Secretary of Defense (Program Management) (Colonel, USAF) |
| 1975-1979 | A member of the personal staff of the Commanding General of the Air Force Security Service, a major air command<br>Chairman of the command's internal Security Council, and the Commander's Management Advisory Team<br>Chairman or member of the: Readiness Steering Group, SIGINT (Signals Intelligence) Architecture Board, Senior Officers Orientation Course Faculty Board, and the Federal Women's Program Council and Equal Opportunity Council<br>Director of Total Force Augmentation and Reserve Force Advisor to the Commander<br>Colonel, USAF, effective January, 1977 |
| 1971-1975 | Division Manager (19 Districts), Avon Products, Inc. |
| 1970-1971 | Director of Projects, Southern Council on International and Public Affairs, Atlanta, Georgia |
| 1969 | Director of "Fifty Years of Communist Cadre Training" project, Institute of International Studies, University of South Carolina |

Additional information on page 2, attached.

**EDUCATION:** Master of Public Administration, Auburn University; Air War College, Air Universit Industrial College of the Armed Forces (25 volumes in correspondence); Air Command and Staff College, Air University; Bachelor of Science, Troy State University; University of South Dakota, Electronics and First Year of Law; See page 2 for continuation.

**ACHIEVEMENTS/AWARDS:**

See page 2, attached.

**RELEVANT PUBLICATIONS:**

**PROFESSIONAL AFFILIATIONS:**

See page 2, attached.

**PERSONAL:**

Born April 19, 1932, Erwin, South Dakota
Wife, Elaine. Three children: Gary, Mark, and Linda; the latter two are each married

## Employment History Continued:

| | |
|---|---|
| 1963-1968 | Special Agent, Air Force Office of Special Investigations (AFOSI), with additional certification as a Technical Special Agent<br>Chief, Operations and Training Branch, Technical Services Division, Tokyo, Japan<br>Chief, Technical Services Division (Vietnam and Thailand), two years ending in 1968. |
| 1961-1963 | Head of Electrical Design, Ray L. Roby and Associates, Consulting Engineers, Mitchell, South Dakota |
| 1960-1961 | State Electrical Superintendent, State Engineer's Office, Pierre, South Dakota |
| 1958-1960 | Head of Electrical Section, Physical Plant, University of South Dakota |
| 1954-1958 | College |
| 1950-1954 | Electronics Instructor and Electronic Warfare flying-crew member, USAF |

## Education Continued

Special Investigations Academy, Air Force Office of Special Investigations; Technical Agent School, Air Force Office of Special Investigations; and Seven electronics, technical, electronic warfare, and instructor schools.

## Achievements/Awards

Included are: Defense Superior Service Medal; Bronze Star; Meritorious Service Medal; Purple Heart; National Defense Service Medal with one Bronze Star; Vietnam Service Medal with Four Bronze Stars; Republic of Vietnam Gallantry Cross with Palm; and the Republic of Vietnam Campaign Medal

## Professional Affiliations

Pi Sigma Alpha National Honor Society
American Defense Preparedness Association
American Society for Public Administration
Air Force Association
Association of Former Office of Special Investigations Special Agents
Association of Old Crows (Electronic Warfare)
Reserve Officers Association
Society of Logistics Engineers

United States
Synthetic Fuels Corporation

# BIOGRAPHICAL DATA

[illegible]: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.

NAME AND TITLE: WILLIAM F. RHATICAN, VICE PRESIDENT FOR EXTERNAL RELATIONS

EMPLOYMENT HISTORY:
(Employers, Dates, Titles)

Prior to joining the Corporation, Rhatican headed his own public relations firm specializing in national issue-oriented campaigns. He also served as Vice President for Public Relations of the American Paper Institute and as Vice President for Public Affairs of The Viguerie Company, the nation's largest direct mail advertising agency.

During his more than eleven years in public service, Rhatican served as Press Secretary to former Secretary of the Treasury William E. Simon and to former Secretary Rogers C.B. Morton at both the Departments of Interior and Commerce. He also served in the White House during the Nixon and Ford Administrations.

EDUCATION:
Bachelor of Science, Seton Hall University

ACHIEVEMENTS/AWARDS:

RELEVANT PUBLICATIONS: Miscellaneous articles for leading daily newspapers including New York Times, Los Angeles Times, Chicago Tribune and Miami Herald.

PROFESSIONAL AFFILIATIONS:

PERSONAL:

United States
Synthetic Fuels Corporation

# BIOGRAPHICAL DATA

TE: THIS INFORMATION IS INTENDED FOR PUBLIC RELEASE.

**NAME AND TITLE:** Dwight Ink, Vice President for Administration

**EMPLOYMENT HISTORY:**
**(Employers, Dates, Titles)**

Director, Community Services Administration, 1981
Vice Pres. for Management, National Consumer Cooperative Bank, 1980-81
Director, Office of Continuing Education and Sponsored Research, The American Univ., 1976-80
Executive Director, President's Personnel Mgmt. Project (U.S. Civil Service Reform), 1977
Deputy Administrator and Acting Administrator, General Services Administration, 1973-75
Asst. Director for Executive Mgmt., Office of Management and Budget, 1969-73
Asst. Secretary for Administration, U.S. Dept. of Housing & Urban Development, 1969
Chairman, White House Task Force on Education, 1965
Executive Director, Alaska Reconstruction Commission, 1965
Asst. General Manager, U.S. Atomic Energy Commission, 1959-65

**EDUCATION:** B.S., Iowa State University
M.A., University of Minnesota

**ACHIEVEMENTS/AWARDS:**

See attached.

**RELEVANT PUBLICATIONS:**

**PROFESSIONAL AFFILIATIONS:**

See attached.

**RSONAL:**

Dwight Ink

ACHIEVEMENTS/AWARDS:

Arthur Fleming Award for Ten Outstanding Men in Government
National Civil Service League Award
Distinguished Service Award, U.S. Atomic Energy Commission
Commissioners Award for Distinguished Service, Civil Service Commission
Distinguished Service Award, General Services Administration
Outstanding Achievement Medal, University of Minnesota

PROFESSIONAL AFFILIATIONS

President, American Consortium for Int'l. Public Administration, 1980-83
Vice Pres., Int'l. Institute for Administration Science, 1980-83
President, American Society for Public Administration, 1978-79
Chairman, Committee on Public Mgmt. and Machinery of Govt., National Academy of Public Administration
Member, National Academy of Public Administration
Member, Board of Directors, National Civil Service League
Member, Board of Directors, American Public Works Association, 1978-81
Member, Board of Directors, Public Administration Service
Member, National Council, American Society for Public Administration, 1977-81

Mr. Schroeder, how did you ever get your job? I read Mr. Noble's biography and it says he is a Republican and I read your biography and it says you are an Independent.

Mr. SCHROEDER. Right.

Mr. YATES. Well okay.

The statement of Mr. Noble may go into the record at this point.

[The statement of Mr. Noble follows:]

**United States Synthetic Fuels Corporation**
1900 L Street, N.W. Washington, District of Columbia 20586 Telephone: (202) 653-4400

Testimony of Edward E. Noble, Chairman
U.S. Synthetic Fuels Corporation
Before the House Interior Appropriations Subcommittee
March 24, 1982

Mr. Chairman, members of the Committee: I am pleased to have the opportunity to report to you this morning on the progress of the Corporation in developing a synthetic fuels capability in our country. Much has changed since the Energy Security Act was passed almost two years ago. Today oil is in plentiful supply relative to demand and prices are declining. Moreover, many projections suggest that, barring a major crisis, world energy supply and demand will remain generally in balance for several years and prices in real terms will rise just about two to three percent above inflation.

Such energy forecasts, coupled with the high cost of money and the many uncertainties in synfuels development, have caused some to begin backing away from the industry. Yet to me -- not one to champion the crisis mentality/crash program approach -- the present stable energy outlook bodes well for the ultimate success of a commercial industry.

The bottom line for federal involvement in synthetic fuels is U.S. security -- economic and defense. Our need for increased energy self-reliance is as strong today as it was in mid-1980 when the Corporation was established. Because we cannot predict future world developments, we cannot know whether in the next decade we will actually need 40 major projects each producing upwards of 50,000 barrels of synthetic product per day. We do, however, certainly need to gain experience with a variety of technologies and resources, to develop financial information, and to establish an infrastructure which can support efficient, rapid growth of a synfuels industry when and as circumstances warrant. At the Corporation today we are moving toward these ends with deliberate speed.

## PROJECT SOLICITATIONS

The key to our progress has been the presence of a Senate-confirmed Board of Directors. At its first meeting on October 28, 1981, the Board voted conditionally to issue a supplement to the initial solicitation as well as a second solicitation for new projects, each of which tentatively approved procedures and criteria for the selection and evaluation of projects.

These conditional decisions were submitted to the Corporation's Advisory Committee, as required by law, and on December 11, 1981 the Board met formally with the Advisory Committee. At that time the supplement and second solicitation were formally issued and the project selection and evaluation criteria adopted.

The Corporation had received 63 proposals in response to its first solicitation. The supplement required these project sponsors to complete their information submissions by January 4, 1982. Twenty-eight projects did so and thus qualified for maturity evaluation. These were conducted by the staff, who made recommendations to the Board at its January 18, 1982 meeting. Of the 28 projects, the Board judged 11 sufficiently mature for evaluation against the strength criteria.

Preliminary project strength assessments were presented to the Board at its February 16, 1982 meeting. Since then the Board has been reviewing this material and the staff has been working to further refine and verify information on each project. The Board meets again this Friday, at which time we will receive final staff recommendations and make our decisions as to which projects under the initial solicitation will advance to the more intensified Phase II evaluation and possible negotiations for assistance. According to our schedule, the first awards will come in the summer.

The second solicitation, which was issued December 11, 1981, will remain open until May 31, 1982. New projects as well as those not advancing under the first solicitation are welcome to apply under this second, general solicitation. While there are, of course, no firm numbers yet on how many proposals will be submitted, we anticipate upwards of 35.

* * *

## EVALUATION CRITERIA

At its first meeting the Board recognized the importance of establishing definite procedures and comprehensive criteria for the selection and evaluation of projects requesting financial assistance. The Board adopted a two-phased process under which each project is first evaluated for eligibility, maturity, and strength. Projects meeting these tests then advance to Phase II, where they are analyzed in detail, information is independently verified and then, as appropriate, financial negotiations are conducted in a competitive context.

In determining maturity, the Board considers whether a project has:

- completed financial viability and technical feasibility studies;
- completed design work sufficient to allow highly accurate cost estimates during Phase II evaluation;
- acquired all rights to the plant site, the key technology, and the necessary resource (feedstock), utility and water inputs;

- secured (or realistically expects to secure) all necessary permits on a schedule consistent with the proposed construction start-up date; and,
- defined clearly the estimated amounts and terms of commitments of each sponsor.

When a project has been judged sufficiently mature, it will then be evaluated for strength, according to the following criteria:

- technological soundness (including project's processing, auxiliary, and environmental control facilities and its scale-up risks);
- comprehensive economic viability study (to determine project/sponsor ability to meet all operating costs and provide debt service and equity return adequate to sustain project);
- potential for compliance with socio-economic, health and safety, water, and environmental regulations;
- potential for replication (including licensing of technology and extent and geographic distribution of resource base);
- management capability (including the sponsor's financial position, overall corporate management, and project operating capability);
- product marketability.

In Phase II projects undergo detailed assessment, especially in terms of strength criteria, competition parameters, and programmatic objectives. This intensified investigation is expected to take about two months, and projects meeting its rigorous scrutiny will then begin financial negotiations. These should last approximately three months and, if successful, result in a determination on the type and amount of assistance to be granted.

* * *

## CORPORATION GOALS

The Energy Security Act sets forth a number of guidelines and goals for the Corporation as it seeks to assist development of a commercial synfuels industry. Foremost among these are production and diversity. To balance these goals and develop appropriate strategies for achieving them, the Corporation has established a Task Force made up of senior staff and headed by its President, Mr. Schroeder.

The Board has received reports from the Task Force at its December, January and February meetings, and on February 16 the Board voted to adopt a resolution that it "be prepared to trade off some near-term production for diversity that will improve the industry's capability for expansion and long-term production."

That is, the Board determined that in our initial stage of operation we should work to gain technical and financial knowledge about technologies and processes necessary to assure that our country can produce synthetic fuels from a variety of resources. If we can accomplish this, then the industry will be in an excellent position to expand production capacity rapidly and efficiently when the marketplace signals.

* * *

## PENDING PROJECTS

Of the 11 projects now undergoing strength tests, four are coal liquids, three coal gas, and one project each peat, oil shale, heavy oil and a coal-oil mixture. These projects are diverse in:

- Location -- from North Carolina to California (two each in California, Wyoming, Tennessee and Kentucky; one each in Alabama, North Carolina, and Utah);
- Feedstock -- use various eastern and western coals, peat, heavy oil, and shale;
- End Products -- high and medium Btu gas, methanol, gasoline, fuel oil, and electricity.

The Board recognizes that nine of these projects are coal based; but in view of the second solicitation now open and additional solicitations likely to come, there would appear to be no conflict between the selection of these projects and our diversity goal. A number of projects utilizing other resources are expected to be sufficiently mature for consideration under future solicitations. The Board is also actively considering the possibility of issuing targeted solicitations, which will assure that we have an appropriately diverse mix of projects before us.

* * *

Testimony of Edward E. Noble, Chairman
U.S. Synthetic Fuels Corporation
Before the House Interior Appropriations Subcommittee
March 24, 1982
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## CORPORATION BUDGET

To carry out these and other planned activities as directed by the Energy Security Act, the Corporation has developed a budget for fiscal year 1983 that is carefully honed and responsible. Our operating budget, including generic studies, is projected at $34.5 million. This is well below the $44.9 million ceiling allowed under the Act, and it is one-half of one percent of our estimated program commitments. We have set the programmatic budget at $8.0 billion, and another $2.0 billion is expected to be carried over into fiscal year 1984.

* * *

## CONCLUSION

To conclude then, the Synthetic Fuels Corporation is acting deliberately and judiciously under the direction of the Board. We have assumed monitoring responsibility for the Union and Tosco projects funded by the Department of Energy under its interim authority. On Friday the Board will advance some projects into Phase II evaluation. By June we will have a new group of projects before us under the second solicitation. And later this summer the Corporation will make its first assistance awards.

In short, our commitment to doing the job is now matched by action.

Thank you, Mr. Chairman. I'll be happy to take your questions.

Okay, Mr. Noble, do you want to tell us how well you are doing and whether you still are going to be in business. I get the impression the Administration is giving the back of its hand to you on a number of things, is that right?

Mr. **Noble**. No, I think the Administration has given us a pretty free hand to operate.

### SRC-II

Mr. **Yates**. Maybe it was SRC-I that I had in mind. Didn't they give the back of their hand to SRC-I?

Mr. **Murtha**. SRC-II.

Mr. **Yates**. That's my memory. What is going to happen to SRC-II incidentally?

Mr. **Noble**. Well, I think at this point it has been pretty well put on the shelf. The Germans have withdrawn and the Japanese, I think, are still very interested in the project. But of course, without Gulf and the United States and West Germany involved, I think they have pretty well put it on the shelf at this moment.

Mr. **Yates**. What does that do to the action of this committee?

Mr. **Noble**. Actually, the action of this commitee?

Mr. **Yates**. Yes, we provide funding for it did we not?

Mr. **Murtha**. Yes, $130 million.

Mr. **Noble**. Yes, sir, I think through the DOE, that is correct.

Mr. **Yates**. Yes, but that doesn't relate to your activities does it?

Mr. **Noble**. SRC-I is still being funded to the tune I think of $130, $135 million.

Mr. **Murtha**. That is right.

Mr. **Noble**. The work is still going on in that operation and they may apply to the Synthetic Fuels Corporation at some future date.

Mr. **Yates**. If they do, you will be very glad to hear their testimony, won't you?

Mr. **Noble**. We will certainly consider it just like any other project, yes, sir. Mr. Chairman, would you prefer that I just submit this testimony?

### SYNTHETIC FUELS CORPORATION PROGRESS REPORT

Mr. **Yates**. That is already in the record. Your statement is in the record. I just wanted you to tell the committee some of the highlights of your statement, generally, how well your Corporation is doing, and what you foresee the Corporation to be doing, during the next year.

Mr. **Noble**. Well, as this statement covers in elaborate detail, we had our first board meeting on the 28th of October. I think since that time we have made some real good progress.

At the first board meeting we had the solicitation which was already in the works. We had 63 proposals in front of us. We did ask the board to approve a supplement to that original solicitation which actually gave us more information on the projects and made the projects a little more specific so as to, we felt, more closely, more correctly comply with the Energy Security Act.

At the same time, we also approved a second solicitation for submittal to the Advisory Committee. The Advisory Committee being the Secretary of Treasury, the Secretary of Energy, the Administrator of the EPA, the Secretary of Defense and Secretary of the Interior.

Then they had 30 days to approve that second solicitation, which they did make their comments on. The board at its second meeting on December 11, approved a second solicitation which was to begin on December 11 and close on March, beg your pardon, May 31st.

The first solicitation we had in front of us at the first board meeting with the 63 proposals, the closing date on that was March the 31st, and that was March 31st of 1981.

We began the evaluation process, which was set up in basically two phases. The first phase addressed itself to the eligibility and what we call the maturity and strength questions. We have now approved—of the 63, we had 28 that actually filled out and met the requirements for the supplemental information, and then from those 28 we passed 11 through what we call the maturity gate. We now have those 11 in front of us to be passed upon what we call the strength criteria.

I would be happy to review that with you if you care to, but——

Mr. **Yates**. I would be interested in knowing what you mean by that.

Mr. **Noble**. Let me take them one at a time.

The maturity question addressed, basically, the financial viability and the economic viability and technical feasibility. It also addressed the regulatory and design requirements. It also addressed the permitting process and the degree that they had complied with the permitting, or realistically expected to comply with the permitting. Then it addressed the commitments that the individual sponsors would make, both the terms of those commitments and the amounts of money that they would be committing to the project.

Now, those were the things involved in what we call the maturity test.

Mr. **Murtha**. What kind of guidelines do you have on commitments, Mr. Chairman?

Mr. **Noble**. Beg your pardon?

Mr. **Murtha**. What kind of guidelines have you set on the commitments aspect of it?

Mr. **Noble**. The law requires that each sponsor have at least 25 percent equity in the project. But also, we determine the terms of those commitments and whether they will be putting that money forward.

Mr. **Murtha**. Does it make a difference if they go to 40 percent, for instance, rather than 25 percent? Does that make a difference in your judgment when you make a final decision?

Mr. **Noble**. You bet. We feel that the more money the sponsors are willing to commit themselves, the more serious they are, the more attention they are going to give the projects with their best management. Yes, sir.

But a 25 percent commitment is a pretty healthy commitment. So we are not necessarily saying they have to go beyond the 25. But if we have two projects and one is going to put 40 percent of their own money up, the other 25, we have to feel that the one that is putting 40 percent of their own money up is a little more serious to that extent.

But, the law only requires 25. The strength criteria addresses itself to a number of things. We go into more depth on the technological feasibility and their design, their scale up of the design of that technology. We go into great detail about their consideration of the environmental effects, as well as economic questions of the project. In the environmental area we also deal with and talk about the socio-economic impacts and how they are addressing the projects' ability to mitigate those health, safety, water inputs, the whole gamut of what we call the socio-economic and environmental impacts.

### ENVIRONMENTAL CONSIDERATIONS

Mr. YATES. Do you require them to have environmental impact statements approved before they file?

Mr. NOBLE. Well, they don't all have to be approved before they file, no, sir. But we do look at the degree which they have met those permitting processes, based on when that construction is to start and when it is to finish.

So, we have to realistically know that they have substantially completed that permitting, or can basically complete it by the time they start their construction.

Mr. YATES. I know you have some oil shale projects here. Have those been cleared through the environmental hurdles?

Mr. NOBLE. Yes. The projects that have now been approved were actually approved under the Defense Production Act, and they were approved by the Department of Energy, that is, the Union Project and Colony Project.

Mr. YATES. You just accept those approvals in connection with your review?

Mr. NOBLE. That is correct, yes, sir.

Mr. YATES. In other words, you don't make a rule de novo on the procedures they have to go through. You just take what they have told you and accepted it at that point?

Mr. NOBLE. Yes, sir.

Mr. YATES. Have there been any lawsuits filed against any of these?

Mr. NOBLE. Do you mean environmental lawsuits?

Mr. YATES. Yes.

Mr. NOBLE. Not that I know of.

Incidentally, I am going to ask Mr. Schroeder or Mr. Ink, or any of our staff who are here, and wish to correct a statement, to feel free to do so.

We have a number of gentlemen that hopefully are more up-to-date on some of these things than I am.

Mr. YATES. You are more the banker?

Mr. NOBLE. Well, I get the blame if it is wrong, and they are supposed to do most of the work.

Mr. YATES. Go ahead.

### PROJECT SELECTION CRITERIA

Mr. NOBLE. There are two more items in the strength criteria and they are the marketability of the product and evaluation of the management of these projects. Those, basically, are what we call the maturity and strength evaluations.

We are right down to the wire on the final part of the strength evaluations. As we go into phase two, at which time the board will pass on these 11 projects to determine whether they go into phase two, those will require more detailed evaluation, and then pass on into what we call the negotiation process.

Mr. **Yates**. How does a project move from phase one into phase two? What is the dividing line?

Mr. **Noble**. Well, they have to pass, as I say, it, and I have listed that strength criteria and maturity.

Mr. **Yates**. Those are all the criteria for phase one?

Mr. **Noble**. Yes, sir.

Mr. **Yates**. If they meet all those criteria, then they move into phase two?

Mr. **Noble**. Yes, sir.

Mr. **Yates**. What happens when they get out of the wonderland of phase one and into phase two?

Mr. **Noble**. Okay. Then they undergo about 2 months of fairly intense scrutiny on the evaluation of the data that they have furnished us. A lot of the data we take for granted that they give us in phase one. We make an independent evaluation of a lot of that data in phase two. If we agree with their evaluation, then we start negotiating with them, for assistance.

Mr. **Yates**. They do not get any commitment from you until they get to phase two?

Mr. **Noble**. That is correct.

Mr. **Yates**. How long does it take to go through phase one?

Mr. **Noble**. Well, we——

Mr. **Yates**. Here you have 11 projects. Is there such a thing as an average time for a project to get through phase one before you——

Mr. **Noble**. It took, it will take 3 to 6 months to bring them through phase one after they have submitted proposals.

Mr. **Yates**. Do you ever send their proposals back to them and ask for corrections or additional information?

Mr. **Noble**. Yes, sir. We sure have.

Mr. **Yates**. Can you give us examples of what happened?

Mr. **Schroeder**. Well, we have an ongoing——

Mr. **Yates**. You better speak up.

Mr. **Schroeder**. We have an ongoing conference with sponsors, after the solicitations come in, as needs arise to clarify what they have furnished, or to furnish additional information. This is a rather constant and fluid process in which we have teams assigned to each project, and these teams study the project submittals and are in touch with the sponsors and get the material updated, and then pass it to the board for decision after the staffs make a recommendation.

### STAFF CAPABILITIES

Mr. **Yates**. How big a staff do you have on these teams? These 11 projects are huge, aren't they?

Mr. **Schroeder**. That is right, sir.

Mr. **Yates**. How big is your staff?

Mr. **Schroeder**. Well, we have a matrix system in our Corporation, so some individuals will be on possibly a dozen different teams. So, the team itself will be 10 to 12 people totally. But we have a few people in the Corporation that have environmental capability to understand what the regulations are; what the problems are; and what some of the solutions are.

Those people are spread throughout all the teams. So, one individual may be on several different projects as a team member.

Mr. **Yates**. You have all different kinds of techniques here.

Mr. **Schroeder**. That is right, sir.

Mr. **Yates**. All different kinds of processes.

Mr. **Schroeder**. That is right, sir.

### STAFFING

Mr. **Yates**. Do you have enough experts on your staff who are able to make the kinds of appraisals of these projects that will furnish the basis for a commitment on your part?

Mr. **Schroeder**. So far we have had a sufficient number of people. We have used some detailees from different parts of the Government where we felt we needed to concentrate.

Mr. **Yates**. Give us an example of that.

Mr. **Schroeder**. Dwight, would you explain, please, the detailees that we have had and do have now?

Mr. **Ink**. At this stage, because the selection process has not reached the point where we have actually entered into negotiations, the detailees that we have had have helped us primarily in the building of the administrative and management infrastructure. We have had several people detailed from the Department of Energy, for example, who have helped us in initial stages, both in some of the engineering areas, and in the contract areas.

Mr. **Yates**. When you say people from the DOE, what level of people have you detailed and what is their expertise?

Mr. **Ink**. In my case, I have had an individual, two, actually, one on a formal detail and one just helping now and then in an advisory capacity.

Mr. **Yates**. What do they do for DOE?

Mr. **Ink**. This individual is in the contract area in the Department of Energy. He is at the GS-14 level in the Department of Energy. He was detailed on a half-time basis to us for about 2 months until we were able to hire our own contracting manager, George Vecchietti, who, by the way, was the top contract man for Jim Webb when he built his team that took us to the moon.

Mr. **Murtha**. Does that cause you any conflict with the idea we are trying to make the Synfuels Corporation an independent Agency?

Mr. **Ink**. This does not give us any problem with independence because we are detailing the individual on the basis of his or her expertise.

And the detailee in that instance did not carry forward anything from the standpoint of departmental policies.

Mr. **Murtha**. How many do you have? What percentage of detailees would there be to employees?

Mr. **Ink**. Oh, very small number. At any one time we have probably had a maximum of four or five.

Mr. **Murtha**. So, you can't get those people any place else? Why would you go to the Government for these people?

Mr. **Ink**. You can detail in from Government agencies. You can't really do that with industry.

Mr. **Murtha**. So you are saying, for a short period of time, you use them when you cannot find anybody in private industry to assist you?

Mr. **Ink**. For a short period of time when either the need is very immediate, and you don't have time to hire, particularly while you are building up, or there is an expertise that you don't need on a permanent basis, but only on a very limited temporary basis.

Occasionally we use some consultants from outside Government. So, we look to a mix of that sort.

Mr. **Murtha**. You have no problem, though, with the number of people or the financial resources for your staffing?

Mr. **Ink**. No, we do not.

Mr. **Yates**. What does that question mean?

Mr. **Murtha**. What I was worried about, is that they will get a massive number of projects, and that the projects would be delayed because they didn't have adequate staff.

Mr. **Yates**. Well, that is only one aspect of the problem. The question is: Do they have an expert enough staff review the projects who know that there is some reasonability and feasibility to the proposals before the Government commits its financial resources, and possibly its liability to those projects.

I take it that was in your question too?

Mr. **Murtha**. Yes.

Mr. **Yates**. What would your answer to that question be?

Mr. **Ink**. As Mr. Schroeder said, at this point, we have had no problem and we believe that the additional staff that we will be bringing in, which will be largely in the projects area, should be sufficient to meet most of the needs. There will always be occasions on which we will need to supplement our staff, generally by drawing expertise from the private sector, and occasionally expertise from the Government sector.

Mr. **Murtha**. I think Mr. Noble wants to comment.

Mr. **Noble**. I just want to comment from a more philosophical point of view. I think the success of this organization or any organization is going to depend on its ability to attract capable, good people. It is a limited group of people in certain disciplines that are even out there to attract.

So, we are trying to do this on a very careful basis. And where that is a permanent employee, we are being very careful in our selection. But also, where it is not a permanent situation, where it is a short-time need, it is my feeling that we shouldn't try to build up a bureaucracy, but if there is somebody eminently capable in DOE or somewhere else, that we should use him.

We do want quality. We think we have got to have quality. And in a few instances, we may have to exercise the right to go over level one, because we are dealing with some very technical, top people when you are talking about these kinds of dollars put at risk for the taxpayers.

Mr. **Murtha**. Do you have the flexibility to do that?

Mr. **Noble**. Yes, sir, we do. It does require at least the tacit approval of the President if you go above level one and he has to at least not disapprove it.

Mr. **Murtha**. It isn't that simple though: If you can't find the person without going above that level, obviously, you could find an adequate person with less capability and background, that you could hire for less. But it is obvious to me that in some cases you just can't hire top notch staff for that price.

Mr. **Noble**. That is absolutely correct, yes, sir. We have had several turndowns, people that we could not hire.

Mr. **Murtha**. At any price?

Mr. **Noble**. Well, we couldn't hire them under the level one. We may have to come back in the next few days and ask the President to approve a few, anyway.

Mr. **Murtha**. I am concerned with the question as I asked it: Are the projects being held up because of lack of expertise or lack of numbers of people?

Mr. **Noble**. At this point they are not, Congressman. If you ask me that question 3 or 4 months from now, and we are not able to get some very key people, I would say "Yes". But at this point we are not held up. Is that your feeling also, Vic?

Mr. **Schroeder**. Well, I believe, sir, that the number of projects that came in is the factor that has to be totally understood.

Let me give you an example, please. One coal gasification project submitted two copies of a proposal to us, and it was in 28 boxes. So, you can get some feel for that. That was not the largest project that came in, but it was larger than the average.

So, the logistics of studying that kind of a proposal are tremendous. I believe we have made amazing progress in handling these. I am quite proud of the projects portion of the Corporation. They have carried the direct responsibility for evaluating this through the matrix system in which the rest of the Corporation participated.

Mr. **Murtha**. But the bottom line is that you have enough well qualified people to go forward without holding up projects; that you can move expeditiously in either approving or disapproving a project?

Mr. **Schroeder**. Yes, sir.

### ADMINISTRATIVE BUDGET

Mr. **Murtha**. What are your financial resources? For instance, how are you funded staff-wise, and how are you funded projects-wise?

Mr. **Schroeder**. Dwight, would you cover the budget area, please?

Mr. **Ink**. We have, for fiscal year 1982, projected about $4.5 billion to be obligated.

Mr. **Murtha**. You fund your staff from that $4.5 billion?

Mr. **Ink**. Yes, sir, we do. This is in accordance with the plan which has been submitted to Congress.

Mr. **Murtha**. Yes.

[COMMITTEE NOTE.—Subsequent to the hearing, Mr. Ink's statement was revised to say: "Staffing is in addition to that, and is in accordance with the plan which has been submitted to Congress."]

Mr. INK. That outlines our plan, which is in this document, Statement of Administration Expenses.

On page 43 you will see that we have estimated for fiscal year 1982, a total amount of administrative expenses of about $20.5 million of which $10.6 million are for personnel compensation. For fiscal year 1983, we have projected what we regard as a maximum of about $16.1 million for personnel compensation out of a total of $28.3 million. In addition to that we also draw from these projected obligations. $4.5 billion for fiscal year 1982 and $8 billion for fiscal year 1983 and about $10 million for generic studies.

## PROGRAMMATIC BUDGET

Mr. MURTHA. How does that work, your obligations? For instance, what do you do from a technical standpoint when you agree, at some point, to either a loan guarantee, or a price guarantee. What do you do, set the money aside?

Mr. INK. Those funds are earmarked at that stage. Now they do not have an outlay until and unless problems arise and the loan is——

Mr. MURTHA. How far can you go, then? For instance, this committee has been instrumental, as you know, in advance funding. We wanted to make sure there was no question about the availability of funds for the Synthetic Fuels Corporation. Under the leadership of the Chairman and Mr. McDade, we pressed hard to make sure you had adequate funding.

What does it mean from a technical standpoint? How far can you go in guarantees, $20 million, $50 million?

Mr. INK. We are, of course, able to go forward in the full amount that is in the President's budget and our Statement of Administrative Expenses which would mean in fiscal year 1982 up to $4.5 billion and an additional $8 billion in fiscal year 1983.

Mr. MURTHA. There is no outlay, so what does it mean?

Mr. INK. In terms of how many projects?

Mr. MURTHA. Yes.

Mr. INK. That is very hard to say because it depends on the mix. Keep in mind, sir, that the proposals that come in may be quite different from the amount which later is actually guaranteed at the end of the negotiations. Since the negotiations have not yet begun in any of these instances, it is very difficult to make an estimate as to that differential.

Mr. MURTHA. But still, if you guarantee a loan or a price, how could you possibly come up with a figure of what the level would ultimately end up to be.

Mr. NOBLE. The Union contract was actually negotiated by the DOE, for example, they established a base price, but this escalates based on a formula which imputes the gross national product inflator and price for natural gas, but anyway, it has this floor which is computed based on the formula. But it also has a guarantee top of $400 million. It also has a time limit and a barrels limit. It does have a specific dollar guarantee.

Any time we enter into a price guarantee or purchase agreement, we will have a dollar figure top on it so that we know the top limit to the authority and to the obligation.

Mr. MURTHA. How much have you obligated so far?

Mr. NOBLE. The DOE has obligated a little over $2 billion, it is actually $2.367 billion.

Mr. MURTHA. You will cover that?

Mr. NOBLE. That is taken out of the Defense Production Act funds and the Nonnuclear Act funds which were in the original $20 billion that was appropriated.

Mr. MURTHA. So, that comes out of the first $4.5 billion?

Mr. NOBLE. No, sir. That comes out of the $5.3 billion that was assigned to the DOE under this interim time period. The remainder that was left out of that $5.3 billion came back to the Synthetic Fuel Corporation when we were declared operational.

I think I put those figures backwards. The uncommitted balance is $2.367 billion out of the roughly $5.3 that was to be available. There was $200 million, I think, rescinded.

[COMMITTEE NOTE.—The actual amount of the rescission was $300 million.]

## EXCESS DEFENSE PRODUCTION ACT FUNDS

Mr. YATES. Would you yield? How much money was transferred from DOE to the Corporation?

Mr. NOBLE. $2.367 billion of the uncommitted portion of the DOE funds which came out of the Nonnuclear Act and the Defense Production Act portion.

Mr. YATES. I guess we better ask the DOE about this when they come in rather, than you.

You just accepted the money and you don't really know more about it than that?

Mr. NOBLE. Well, the law says, what I think the intent was, that when we were set in place, that they wanted the DOE to start on this program quicker than we had the ability to staff up and be prepared.

Mr. YATES. Right. This committee initiated that.

Mr. MURTHA. Right.

Mr. NOBLE. Mr. Schroeder has given me a note that says that that is being audited now.

Mr. YATES. By your group?

Mr. SCHROEDER. By outside auditors.

Mr. YATES. To see that you are getting everything you are entitled to?

Mr. SCHROEDER. Yes.

Mr. YATES. I don't blame you.

Mr. INK. Could I just add one comment?

The precise amount has not been fully determined. It will be in the range of $2.3 billion.

Mr. YATES. That is an approximation.

Mr. INK. That is an approximation. The exact amount may turn out to be somewhat different than that, but not a great deal.

## STATUS OF PROJECTS IN FIRST SOLICITATION

Mr. **Yates**. You have listed 11 projects that are in phase one and are moving, you hope, toward phase two.

How close are they to phase two?

Mr. **Noble**. We will have our board meeting on Friday, March 26, and we will make a determination, at that point, of those which will pass into phase two.

Mr. **Yates**. I see. Does your answer mean that all of them are ready for passage into phase two, or only some of them?

Mr. **Noble**. They are eligible if they meet the strength criteria.

Mr. **Yates**. All of them. All 11?

Mr. **Noble**. That is correct. The board reviewed these 11 at their last meeting. They have asked additional questions since then, and they will, in their meeting Friday, determine which of those 11 will be eligible for phase two.

Mr. **Murtha**. That doesn't make any obligation of the Government?

Mr. **Noble**. None whatsoever. It just means that we are going to much more seriously evaluate everything they have given us, and then, if they pass muster at that point, they will be able to—we will start negotiations with them.

Mr. **Yates**. The first question in my mind now is, Are there other projects pending in phase one of your Corporation? Has anybody else filed?

Mr. **Noble**. I will get Mr. Axelrod, but I think a couple of dozen of those who either didn't meet the maturity gate in the first solicitation who have indicated that they are going to file under this second solicitation, and I think there are a number more. Mr. Axelrod, do you want to give me the exact numbers on those if you have them?

Mr. **Axelrod**. There are 24 of those who submitted in the first solicitation who have indicated to us that they will either file for the second solicitation, or they are thinking of filing. And there have been about a dozen other sponsors who have been in to see us who have indicated their possible intention to file.

So, the number is somewhere around three dozen.

Mr. **Murtha**. When is the second solicitation?

Mr. **Noble**. It is going on now. It will close May 31st.

Mr. **Yates**. Are you going to have a third solicitation this year?

Mr. **Noble**. I would anticipate, yes, that we would have a third solicitation.

Mr. **Yates**. The chart which is on page 14 of your Statement of Administrative Expenses indicates that a fourth solicitation will be coming along.

Mr. **Noble**. Yes, sir.

Mr. **Yates**. Did you receive any applications in your initial solicitation other than the 11 that are listed here?

Mr. **Noble**. Oh, yes. In the initial solicitation there were 63 proposals. And then there were about five to six that came over from DOE.

Mr. **Axelrod**. Five.

Mr. **Yates**. What happened to the other 52?

Mr. **Noble**. Other than the 11?

Mr. YATES. Yes.

Mr. NOBLE. All but 28 did not, as you can imagine, they are all the way from people that have done an awful lot of research, very mature projects, to kind of pie in the sky projects.

Mr. YATES. Yes.

Mr. NOBLE. And, as I say, all the way from very serious to almost——

Mr. YATES. What you are saying then is that they did not meet your criteria?

Mr. NOBLE. That is correct. Only 28 of the 63 filed the detailed supplementary information with us.

Mr. YATES. I see. What happened to the other 17?

Mr. NOBLE. Len, do you want to comment on that?

Incidentally, anybody that does not meet any one of these gates is eligible to come in and be debriefed by our staff on exactly why they didn't meet the criteria, and if they want to reapply, they know what they need to do to bring theirs up to standard.

Len, you may want to comment on that.

Mr. AXELROD. I am Vice President of Technology.

Mr. YATES. We know that you have 11 pending. We don't know what happened to the other 17. What happened to them?

Mr. AXELROD. Of the 28 which were reviewed by the Board of Directors at the February meeting, the Directors made the decision on the basis of the facts presented to them by the staff that only those 11 had passsed the maturity gate. The others were deemed not to be yet sufficiently mature to proceed. They have the option to resubmit under another solicitation.

Mr. YATES. Are they still pending?

Mr. AXELROD. We have kept live files on them if they requested it. Most of them are included in the list of two dozen who have indicated to us that they will resubmit again for the May solicitation.

Some of them are going ahead and continuing to work to bring maturity of their projects up to meet the criteria.

Mr. YATES. Are they at different stages of maturity, those that were not accepted? Are some of them almost mature, to the point of where at the next meeting of the board, for example, they might be accepted? Or are they not at all close to acceptance?

Mr. AXELROD. Some of them had very specific areas that they had to do something with, such as the environmental area or water or the site.

In some places they just have not done the engineering. If they get those things taken care of at the second solicitation, they will then go through the maturity evaluation just as they did for the first solicitation.

Mr. NOBLE. The second solicitation doesn't close until May 31st.

Mr. YATES. Have you received many proposals under the second solicitation, or do you think they will come in at the last minute? minute?

Mr. AXELROD. We suspect they will come in mostly towards the end. We have received some letters indicating that they intend to.

Mr. YATES. I am still concerned about the capabilities of determining when a project is mature. I am also concerned about negotiations in the second stage.

You are moving into your second stage, and into negotiations for the first time. Is your staff expert enough to undertake negotiations, on a face-to-face basis, with some of the most able engineers, financiers and experts in the country?

Mr. **Noble**. Frankly, Mr. Chairman, we do need a few good people, and this is the area that it is absolutely vital if we are not to make mistakes that will cost literally millions, and maybe billions of dollars.

And this is why we think it is so vitally important that we have not a lot of people, but a few really good, able people. And we are in the process of trying to find those people, and it is difficult to get these experienced people.

You are exactly correct. When you are talking about a billion dollar project, or several million dollar projects, you are talking about the best financial minds that the corporate world can bring to bear.

And we need those kinds of equally——

### CONFLICT OF INTEREST POLICY

Mr. **Yates**. Yes, I agree with you that you do need them. The question is, How do you get them? Sitting here, it occurs to me, that even if you were to contract for such assistance, the contracting parties whom you would engage would inevitably have had some kind of a corporate relationship or contractual relationship with many of these companies that are applying for approvals from you.

Mr. **Noble**. Under our disclosure act, we go in total depth into their conflict of interest.

Mr. **Yates**. This is disclosure for your employees. Is it disclosure for contractors as well?

Mr. **Noble**. Yes, sir. Any contractor that has a contract over $25,000 is reviewed both in our legal area and our procurement area and approved by myself.

We are looking very carefully at those conflicts of interest, particularly if they will be dealing in the evaluation of negotiating process.

Is that accurate, Vic?

Mr. **Schroeder**. Yes.

Mr. **Murtha**. In conjunction with what the chairman is saying, it would seem to me that there is a limit to the number of people who qualify as type of experts you are looking for. I wonder how you will be able to find a person who is not involved with the same companies that are seeking the contracts.

Mr. **Noble**. It isn't totally easy.

Mr. **Yates**. I guess that could be called an understatement.

Mr. **Schroeder**. Yes, we have an active ongoing recruiting process in which I do not think it is an exaggeration to say several thousand applications have been furnished. In the area of the significant leadership in the decisionmaking process, Mr. Axelrod is one experienced, totally competent individual in the technical and engineering area.

We are fortunate to have him here, and that is the type of individual that we are looking for in a couple of other critical areas. We have had something——

## TECHNICAL CAPABILITIES OF STAFF

Mr. **Yates**. I don't want to demean Mr. Axelrod nor insult him, but Mr. Axelrod, would you tell us what your background is? Would you put a biography into the record for us, as the Chairman and Mr. Schroeder have done?

[The information follows:]

### Biographical Data

Note: This information is intended for public release.

Name and title: Leonard C. Axelrod, Vice President for Technology and Engineering.

Employment history: (Employers, Dates, Titles)—

February 1981 to Present: Vice President for Technology and Engineering, Synthetic Fuels Corporation.

November 1945 to February 1981: The M. W. Kellogg Company.

Senior Vice President, Research and Development.

Vice President, General Engineering Houston Operations.

Director, Process Engineering Department.

Manager, Inorganic Process Division.

Process Engineer, Piping Systems Engineer.

Project Engineer, Rocket Test Engineer.

January 1941 to November 1945: Explosives Research Laboratory, NDRC.

Education: University of California, Berkeley, 1941, Honors in Chemistry.

Achievements/Awards:

Relevant Publications: Many.

Professional Affiliations: AIChe, ACS, AIC, API, WEC.

Mr. **Yates**. Are you the expert that they are depending upon?

Mr. **Axelrod**. No.

Mr. **Yates**. Are yours the broad shoulders upon which the whole Corporation rests, like Atlas holding up the world?

Mr. **Axelrod**. My job just is in technology and engineering as Vice President.

Mr. **Yates**. You are in charge of technology and engineering?

Mr. **Axelrod**. Yes, sir.

Mr. **Yates**. You are Vice President in charge of engineering and technology. All right. Here we have your biography. Leonard C. Axelrod. He didn't call you Leonard or Len, did he?

Mr. **Noble**. Yes, sir.

Mr. **Yates**. I thought I heard something else.

All right, you are Vice President for Technology and Engineering in Synthetic Fuels. From 1945 to 1981 you were at the M.W. Kellogg Company. What does Kellogg do?

Mr. **Axelrod**. M. W. Kellogg is an engineering contractor servicing the processing industry.

Mr. **Yates**. You have a good background. You were Senior Vice President for Research and Development; Vice President, General Engineering in charge of the Houston Operations. Boy, you had to be good to survive down there.

You were Director of the Process Engineering Department, Manager of Inorganic Process Division, and so forth.

From 1941 to 1945 you were with the Explosive Research Laboratory, NDRC.

Mr. **Axelrod**. National Defense Research Commission.

Mr. **Yates**. You graduated from the University of California, Berkeley in 1941, with honors. You have had publications, professional affiliations and you had nothing personal. Right?

Mr. **Axelrod**. That is what it says.

Mr. **Yates**. All right, Mr. Axelrod. I will accept your qualifications for the moment. There are so many different kinds of activities here, so many different kinds of expertise required. Are you qualified to handle all of these?

Mr. **Axelrod**. Not all of them. But I have been involved——

Mr. **Yates**. How do you work?

Mr. **Axelrod**. I have been involved for 35 years in almost all of the aspects of developing processes, bringing them to first commercial operation, designing them, engineering them, procuring them and starting them up.

Mr. **Yates**. Okay.

Mr. **Axelrod**. And negotiating.

Mr. **Yates**. All right. I can understand that you have a background that would permit you to appraise the qualifications of others.

I assume from what the Chairman has said, this is your prime responsibility here—to hire competent people.

Mr. **Axelrod**. Yes, sir, and to direct their operations.

Mr. **Yates**. Do you hire them or do you have someone else do that?

Mr. **Axelrod**. Somebody else does the salary negotiations with them.

Mr. **Yates**. But who does the hiring?

Mr. **Axelrod**. I do.

Mr. **Yates**. Okay. In other words, there ought to be an expert passing on other experts.

So you are that expert. Are there other experts who join you in passing on other experts?

Mr. **Axelrod**. Yes.

Mr. **Yates**. Can you tell us who they are?

Mr. **Axelrod**. Some of them are people in the projects department who have similar types of experience.

Mr. **Yates**. Okay. Does that include Mr. Bayrer?

Mr. **Axelrod**. Yes, and Mr. Coles, Mr. Rogers who works for Mr. Bayrer.

Mr. **Yates**. Mr. Cowan?

Mr. **Axelrod**. I do not think you have—they are not officers. They are engineers.

Mr. **Yates**. I see.

Mr. **Axelrod**. Now that we have been able to assemble the staff, I use the staff I have assembled to help me interview.

Mr. **Yates**. It is a tough job isn't it?

Mr. **Axelrod**. Yes, it is. It was fortunate we had the 6 or 8 months hiatus without a Board of Directors so we had the time to select carefully.

Mr. **Yates**. Would you want another hiatus?

Mr. **Axelrod**. No.

Mr. **Yates**. Okay.

Mr. **Noble**. Then we have also talked to people in industry, too, about people, have we not?

Mr. **Axelrod**. Yes, we have. We go back and reference.

Mr. **Yates**. Educate me. You have coal liquifaction, you have oil shale, tar sands, you have coal-oil mixture. There are nine different kinds of coal liquifaction projects, several of which are different. Is your expertise adequate, and is the expertise of your colleagues adequate to cover all the projects that your Board of Directors has to pass upon?

Mr. **Axelrod**. I have had experience in most of those areas.

Mr. **Yates**. Coal liquifaction?

Mr. **Axelrod**. Yes, sir. The main exception being the shale oil. And one of the first people I hired was one of the detailees from the DOE you discussed earlier who was working in the shale oil area for the DOE. We brought him over at a time when we couldn't hire anybody. When the detail was up we hired him, filled in that gap. The people that I have been able to find also have experience in, each of them, in several facets of the work.

### SUFFICIENCY OF SALARIES

Mr. **Murtha**. How many, Mr. Axelrod, could you not fill? How many important vacancies could you not fill because of salary problems?

Mr. **Axelrod**. At the present time, one.

Mr. **Murtha**. Is that an important vacancy, a critical vacancy?

Mr. **Axelrod**. Yes, I think so, as far as helping me is concerned, that is correct.

Mr. **Noble**. May I say that Mr. Axelrod was promised a salary considerably in excess of the level one, and really out of service to his country, he is still here. I feel——

Mr. **Yates**. I am sure your experts would be raided. It happens all the time. The Government gets a good person, and private industry come along and offers, twice, three times the salary.

Mr. **Murtha**. Under the authorization of the Synfuels Corporation we can pay them more. Why don't we?

Mr. **Noble**. Well, I anticipate and hope that the Board will approve that at the next meeting. It is an item before the Compensation Committee at this time. We did feel it was necessary to have a second study done because the first salary study was criticized. We have now done a second study which is a public record. We also now know a lot of people that have turned us down because of this. And I appreciate the question.

### BACKGROUND OF BOARD MEMBERS

Mr. **Yates**. Well, here we have the Board of Directors, Mr. Noble, Mr. Schroeder, Mr. Wilkins, Mr. Thompson, and Mr. Monks. Mr. Axelrod has passed muster. He is qualified. But Mr. Axelrod is going to present 11 very technical applications to the Board of Directors for phase two on Friday. Mr. Noble was Chairman of the Board of Noble Inns, Director of the Auto Crane Company, previous director of an oil-related company.

You would not say you were a technician would you, Mr. Noble?

Mr. **Noble**. No, sir.

Mr. **Yates**. Mr. Schroeder would you say you are a technician? You were Manager of the Atlanta Apparel Mart; Executive Director of the Peachtree Center; past President and Chief Executive Officer of Aplomb Plum, Inc., a real estate consultant firm; President of Resort Properties; and so forth.

You are not a technician, are you?

Mr. **Schroeder**. No, sir, my expertise is in development.

Mr. **Yates**. Right. Then is Mr. Wilkins here?

Mr. **Noble**. No.

Mr. **Yates**. All right. He is the founder and managing partner of the Maverick Company. What is the Maverick Company, does anybody know?

Mr. **Schroeder**. It is an oil development company.

Mr. **Yates**. He is a former President of Pizza Huts of Louisville; Chairman of the Board and President of Pizza Corporation, and served as Vice Chairman of the Board of Pizza Huts. I would say he was not a technician, wouldn't you?

Mr. **Schroeder**. That is right, sir.

Mr. **Yates**. Then we come to Mr. Thompson. He is a banker. He is Chairman and Chief Executive Officer of the Utica National Bank and Trust Company.

He is not a technician? He would be more a financier, wouldn't he?

Mr. **Schroeder**. That is right, sir.

Mr. **Yates**. Then Mr. Monks comes along. He served as Chairman of the Boston Company; former President of the Maine Wood Fuel Company; held directorships with several coal companies including Westmoreland, Imperial Smokeless, Winding Gulf and Penn-Virginia.

What is the Boston Company, is that a financial company?

Mr. **Schroeder**. Yes, sir.

Mr. **Yates**. So you are all financiers, right? And you are going to have to rely entirely on Mr. Axelrod. You have two vacancies on the board.

Mr. **Noble**. May I say this, Mr. Yates?

Mr. **Yates**. Sure you may.

Mr. **Noble**. I think Mr. Schroeder is being a little modest.

Mr. **Yates**. This is no time for modesty.

Mr. **Noble**. He is probably, in my opinion, one of the finest big project people in the United States.

Mr. **Yates**. I would agree with that.

Mr. **Noble**. This is what——

Mr. **Yates**. I don't doubt that and I don't mean to demean any of you. I think that you are, in your own fields, highly qualified. The only question I am raising is the same question I raised with respect to Mr. Axelrod. You are going into a very technical field, an extremely technical field. While it is true you will have to look at balance sheets and make appraisals and so forth, which are the expertise of a financial officer, you are going to have to rely on Mr. Axelrod and on Mr. Axelrod's colleagues for technical input.

Now, that is not your fault, you know. I don't want to insult you. I think perhaps I may be being somewhat critical of the President in not having given you banking positions rather than technical positions.

Mr. **Noble**. May I make this observation?

Mr. **Yates**. Sure you may.

Mr. **Noble**. I make no pretense to being a technical person. And we are dealing with extremely technical situations. I think we are calling on the technical people, but also, we are also dealing with companies who must put in a sizable amount of their own money.

I honestly feel the Government goes astray when they start telling industry what technology to use. I think the industry's money that they are willing to put into these things is a pretty good evidence, and this is the reason that I think it is so important that we really determine the real dollars that the industry is putting in, because when they put these dollars in of their own money, they evidence the fact that they are secure and feel confident that the monies that they spend will be well spent.

We do need good technical people like Mr. Axelrod, absolutely. We also need people like Mr. Schroeder who has handled multiple projects and knows how to manage those projects and how to structure those disciplines.

Mr. **Yates**. Wouldn't it be an interesting speculation to wonder whether Mr. Thompson, for example, who was Chief Executive Officer of Utica National Bank and Trust Company would be willing to put up the guarantee of his bank rather than the Federal Government's guarantee?

Mr. **Noble**. That is a good question.

Mr. **Yates**. It is a real test, isn't it?

Mr. **Noble**. It is a real test, it absolutely is. A lot of these projects would have big difficulty getting financed just on their own. The Exxons of the world can do that, but even some of the major companies, Union Oil, which is basically carrying their own financing, and they are certainly one of the big oil companies, this one project represents about 27 percent of their net assets.

So, we are really talking about megabucks. And we do, and you are exactly correct, we need the best people we can find.

Mr. **Yates**. All right.

Mr. **Axelrod**. May I say something?

Mr. **Yates**. Sure, Mr. Axelrod. You can say anything you want.

Mr. **Axelrod**. I want to say a couple of things. One of them, I want to tell you how hard Mr. Noble, Mr. Schroeder, Mr. Monks, Mr.—the others have worked——

Mr. **Yates**. I agree with you.

Mr. **Axelrod**. And have made us work so we will give them the information they need.

Mr. **Yates**. I would agree with you.

Mr. **Axelrod**. I think you understand we are partly in the banking business and part of the banking business is to understand your customers' needs and to understand his business so that you can service him.

What we are trying to do on the technical side, our financial group, our projects group, our legal group, is to provide information to a group of decisionmakers in a form that they can use it.

For instance, my final statements to them are not about nuts and bolts, but where are the areas of risk, where is the thing likely to go wrong, what has been done about it. And then, to translate this into contingencies, schedule items, capacity, potential performance will be reflected in the financial analysis which is presented to the board to help them in their decisionmaking.

This is the way the whole thing comes together, and why people with the backgrounds such as those that the Directors have are very useful in this capacity.

Mr. YATES. I do not think there is any question about it. I think they are useful. I hope the other two vacancies are filled with technical people. Because the five he has now are all bankers and developers, right? You fellows are financial men, which is good in a financial corporation.

Mr. NOBLE. He is a big development construction——

Mr. YATES. Isn't that a financial——

Mr. SCHROEDER. Well, that is part of it, sir. Part of it is management risk analysis and part of it is equity gathering. Part of it is financing, part of it is technical.

Mr. YATES. Okay, good luck to you. With your background I just hope that you know what to do about coal liquifaction—but that is Mr. Axelrod's baby, isn't it?

Mr. AXELROD. He knows a bit about it.

### SALARIES OF BOARD MEMBERS

Mr. MURTHA. What are the board members paid?

Mr. NOBLE. The previous board approved a $10,000 a year plus $300 per meeting plus $300 per meeting expenses.

Mr. YATES. How many meetings do they have?

Mr. NOBLE. We have had a meeting just about every month since we have been in business. I would assume we would not have to do it on quite such an intense schedule, but we were starting behind the curve a bit, so we really have been putting in some long hours.

Mr. MURTHA. I saw you had some meetings in the field and I would encourage that. That was a good idea. Are you going to continue that policy?

Mr. NOBLE. Yes, sir, we will do it on occasion. It is expensive to take all your staff, as we did, to Salt Lake City for one meeting and Nashville to another meeting. But we do think it is important to get out and meet the people where these things are going to be built, who are going to live with the projects and going to be affected by the socio-economic and environmental impacts. I think it is important we do that on occasion, yes, sir.

### OFFICER SALARIES

Mr. YATES. Mr. Schroeder then will be the Chief Operating Officer. What salaries do your officers get? Are those in the record anywhere?

Mr. SCHROEDER. Dwight, are those in the record?

Mr. INK. I do not think we submitted them.

Mr. NOBLE. At this point, they are held to level one, but the recommendations of the Compensation Committee will probably be forthcoming at the next meeting.

Mr. YATES. The list of SFC officers' salaries may go into the record at this point.

[The salary information follows:]

*SFC officers current annual salary as of Mar. 15, 1982*

| | |
|---|---|
| Edward E. Noble, Chairman | (1) |
| Victor A. Schroeder, President | $69,630 |
| Dwight A. Ink, V.P.-Administration | 65,000 |
| Wm. R. Rhatican, V.P.-External Relations | 69,630 |
| Ralph Bayrer, Deputy V.P.-Projects | 65,551 |
| Neil Eisner, Acting Chief Financial Officer | 69,630 |
| Edward F. Cox, General Counsel | 58,500 |
| Charles A. Cowan, V.P.-Projects | 62,500 |
| Len Axelrod, V.P.-Technology and Engineering, Inspector General | 69,630 |

[1] $175,000 authorized.

Mr. YATES. Are you full-time Chairman, Mr. Noble?

Mr. NOBLE. Yes, sir.

Mr. YATES. All right.

Mr. MURTHA. Do you see what the Chairman is working for, Mr. Chairman?

Mr. YATES. He is working for nothing.

Mr. MURTHA. That is right. $1.

Mr. YATES. Doesn't even give him a dollar on this list.

Mr. NOBLE. They haven't given me the dollar yet, Mr. Murtha. I think I ought to at least get that one framed, don't you?

Mr. MURTHA. Absolutely. It is pretty impressive.

Mr. YATES. This may go into the record at this point.

[The organizational chart follows:]

Mr. **Yates**. The board members will serve part-time, is that correct?

Mr. **Noble**. With the exception of Mr. Schroeder, our Chief Operating Officer, he is also a full-time member.

### APPRAISAL OF SYNTHETIC FUELS INDUSTRY

Mr. **Yates**. That is right. What is your assessment of where you are going with your task? What is the hope for the synthetic fuels industry? You haven't really given us an appraisal.

Have you had enough time to look at the industry yet? You have to look at the world and the industry and wonder what Sheik Yamani and his colleagues are going to do next. Some of the largest corporations in the country are risking a great deal of their capital in projects that may or may not be productive.

You have to decide whether to commit the credit of the United States to that purpose. What is your impression at the moment, Mr. Noble?

Mr. **Noble**. Mr. Chairman, I think it is very difficult because we note, unquestionably, the need to go ahead for economic security and defense security reasons. I think we need and must go ahead to develop the technologies, to develop the infrastructure of people. The leadtime on these plants, a minimum of 5 years, most of them 7 to 8 years.

One corporate official with one of the major companies put it in perspective when he says it takes us a minumum of 5 years to build one plant, which is longer than it took to fight World War II.

So, with these leadtimes in question, I think we must go ahead to develop this technology and infrastructure of people both to build the plants, to run the plants, to manufacture the equipment necessary.

At the same time, we have to bear in mind that the realities are that at this time, we do have a surplus of fuel on our hands and there may be this surplus on hand for a few years out.

So, it is a very difficult thing. Yet, I think it is necessary to move ahead, at least to get some of this stuff, technology and infrastructure started. It could be that we will waste some money. I hope not. Because as prices drop, if they do drop, it does make synthetic fuels much more marginal. I think it is something we have just got to keep very closely in mind as we are negotiating the deals.

But, with the realization that roughly 90 percent of our fossil fuels are tied up in things like coal and oil shale rather than liquid petroleum and natural gas, I think it is necessary to go ahead and get some of these technologies started. I am not inclined, as I put in that statement, to work under the crisis mentality. But I do want to do it with a lot of caution, and very aware that, to just stand back and throw money at the progam is not the way to do it.

But, cautiously, responsibly, yes, we should start.

Mr. **Murtha**. A key point, as you said, is don't do it under crisis management, because at some point, as economic conditions get better, the surplus of oil will dwindle and we will be back to the possible crisis. I agree with that completely.

Mr. **Noble**. That is correct. We must lengthen this bridge that we have between the time when we are using, as we are now, the nonrenewable fuels, to some time in the future when we are using the renewable energy sources.

### WORLD SYNTHETIC FUELS DEVELOPMENT

Mr. **Yates**. How does U.S. industry compare with the world's synthetic industry? Are we behind?

Mr. **Noble**. Actually, other than South Africa and the oil shale, I mean the tar sands projects up in Canada, and maybe one big plant in East Germany, I guess we will be moving to the forefront. At this point we are behind. Len, you may want to comment in more detail on that.

Mr. **Axelrod**. Surprisingly enough, there are activities almost all over the world. Ed has mentioned the two major ones which are in Canada, the Canadian activities, of course, are in trouble because of the pricing problems between the Government——

Mr. **Yates**. Are you talking about the tar sands?

Mr. **Axelrod**. Yes. The South Africans, of course, started in 1956 with their first project. They are now bringing their second up to full production, and getting ready to start up the third one. Their aim is, quite frankly, energy independence which they expect to reach with the fourth project which is in the planning stage.

The other two areas where there are major projects going ahead are: Brazil which is going ahead apparently with an oil shale project with technology that they have been developing for the last 15 or 20 years which is very much like some of the technologies which have been developed here; and second, I think the biggest surprise is that people who are doing a great deal are the Peoples Republic of China. They have a very fortunate situation where a big bed of coal which they are mining is overlain with a big bed of oil shale.

So, they have no cost for mining the oil shale. They are burning it directly and they have been able to redesign furnaces to handle the ash.

Mr. **Yates**. They burn it directly?

Mr. **Axelrod**. Yes, sir.

Mr. **Yates**. It must be very rich oil shale.

Mr. **Axelrod**. It is pretty rich but they have had to modify all of their boilers that they are using it in in order to handle the high amount of ash. They are also putting in coal gasification units to make synthesis gas to make fertilizer from the ammonia. Some are using the Lurgi which is used in South Africa and considered for this country, and in some they are putting in the Texaco unit idea, where there are pilot plants in this country and Germany.

Other areas of activity include Federal Republic of Germany, East Germany, Australia and Japan. Australia is the center of this because of its large resource of coal. Of course Australia and South Africa are in competition with our coal resources for export.

Australia has put in some research money but mostly they have made agreements with the Japanese and the Germans for joint studies and joint research and development.

So, there is a general picture of activity, of interest, for recognition that synthetic fuels will be needed. But, we seem to be proceeding at about the best rate of speed as any of them.

### IMPACT OF WORLD OIL PRICES

Mr. **Yates**. Is your decision influenced by world oil prices?

Mr. **Noble**. World oil prices do impact on the financial viability of these projects.

Mr. **Yates**. Will you go forward even though the oil glut continues?

Mr. **Noble**. We have to project what we think, and we are not only using our figures, we are trying to get the best estimates of industry also, but I think we have got to go ahead with a few projects. If it drops drastically, then I would say we would have some very uneconomical situations.

Mr. **Yates**. When you say going forward with a few projects, do you know which few? It is expected the Board of Directors will approve them all, isn't it?

Mr. **Noble**. The 11 projects?

Mr. **Yates**. I am not asking what the Board——

Mr. **Noble**. I would guess they would not approve all of them at this sitting, but I don't want to presume on their vote at this point.

Mr. **Yates**. Nor do I. I guess if Sheik Yamani wanted to knock you out of business, he would continue the oil glut, wouldn't he, for a while?

Mr. **Noble**. He may not have as much control over it, but that is also another reason to go ahead and develop the technology. I have made this point several times. If we can show that we can develop the technology at a certain constant dollar value, if we can show in a constant dollar value we can do oil shale, we can make the coal conversions, then I think, and I have said this several times, it represents a little bit of a club under the table so to speak to let them know that they can't just "pull our chain" too far.

Mr. **Yates**. How much of an investment is represented by the projects of the 11 groups that will come before you?

Mr. **Noble**. Do you have a figure on that, Len?

Mr. **Axelrod**. I don't have it with me.

Mr. **Yates**. Pretty massive, isn't it?

Mr. **Noble**. It is massive, yes, sir.

Mr. **Murtha**. Two or three B-1 bombers, Mr. Chairman.

Mr. **Yates**. Half a B-1 bomber. I guess so.

You are required by the Energy Security Act to "balance diversity and significant production capacity." What does that mean? I know Congress said that you have to do it, but how would you interpret that? Who interprets that, the Chief Operating Officer?

Mr. **Noble**. The Congress as you know, did set certain production goals.

Mr. **Yates**. Yes.

Mr. **Noble**. Honestly we have not been able to determine how those goals were arrived at.

### DIVERSITY GOALS

Mr. **Yates**. What does "diversity" means to you, geographically, resource base?

Mr. **Noble**. Both technology diversity, technology in resource base and geographic diversity.

Mr. **Yates**. Would you consider support for pilot plants?

Mr. **Noble**. The law does not permit us to support pilot or demonstration plants, only those which either are a commercial plant, or the first module could be a commercial plant.

Mr. **Yates**. Certain goals have been established for you: 500,000 barrels of crude oil equivalent by 1987, two million barrels by 1992. Are you going to meet those goals?

Mr. **Noble**. No, sir, we probably will not meet those goals.

Mr. **Yates**. All right. What goals do you think are realistic?

Mr. **Noble**. At the last meeting we made the determination to concentrate on the diversity rather than the production goals. Our thinking and reasoning was that, as I mentioned earlier, we need this technology diversity. And in order to meet, or better meet the long-term goals, we think it is more important that we move towards the diversity and technology and resource base early on in our process.

### PRODUCTION GOALS

Mr. **Yates**. Mr. Noble, how many barrels do you expect to be producing by 1987?

Mr. **Noble**. Do you want to make a shot at that, Vic? It is a tough one.

Mr. **Yates**. Take a shot.

Mr. **Schroeder**. Secretary Edwards told me that he had learned since he came up here that it was easier to be a grenade thrower than it was a grenade catcher.

Mr. **Yates**. Well, apparently he caught a couple of grenades.

Mr. **Schroeder**. Mr. Chairman, we don't know the answer to that at this point. We felt that it was more responsible to significantly concentrate on resource diversity. Out of resource diversity we thought we were led to technical diversity, and also led to some geographic diversity. We felt that was the best foundation to build under this new industry with this process.

I believe that the oil surplus will significantly affect the 1992 goals, if in fact there is a long-term glut, if in fact the prices do stay flat, the probability that industry will invest its minimum of 25 percent in plants that will meet that kind of goal is reduced.

In the short term, we probably are not going to be able to meet that goal, simply because of the time involved in developing a plant and bringing it on line.

### PILOT PLANTS VS. COMMERCIAL PLANTS

Mr. **Murtha**. Is there any advantage to your having pilot projects included in your mandate? I know they are prohibited now. The reason was that Congress wanted the Synthetic Fuel Corporation to go commercial and produce oil. Would there be any advantage to changing the law to include pilot projects?

Mr. **Schroeder**. There are several sponsors that are giving some thought to a pilot plant as a first module to a commercial plant. And in fact that is the way I look at the Union Oil of California project.

I believe if the risk becomes greater that the sponsors will seriously consider that. It is my opinion some of them will go to that.

Mr. YATES. Well, let's take a look at our hearings last year when we had Mr. McAtee before us. I asked him the question, "Is there a distinction to be drawn between demonstration and commercial? As I understand what you are saying now, demonstration may be commercial."

Mr. McATEE. That is right. Our act doesn't define the term "demonstration project" other than the joint venture projects which I will get to in a minute—which may be a place that is relevant for these five projects that don't automatically come over with the funding under the DPA and NonNuclear Act—but other than those projects our legislation limits funding by us to synthetic fuels projects as defined.

Now, while the section defining "synthetic fuels project" requires a project funded by the Corporation to be "for the purpose of commercial production of synthetic fuels," it does not define commercial production, so, now we are down to what does it mean by "commercial production?" In our judgment, the question of whether a facility is for commercial production depends upon a number of factors which, when considered in combination, satisfy the Corporation that the principal purpose of the facility is to produce a sufficient quantity of marketable products. The fact a project may have been labeled—

And Mr. Yates unfortunately interrupts and says:

That would include research and development. If you are going to include demonstration plants in that kind of a demonstration, why then can you not include as well research projects because that is part of the same process. I think what you are saying is that a demonstration plant leads to commercial development and therefore it is within the definition that is in the act. If that is true, so would research because that, too, leads to commercial development, does it not? What is the distinction?

Mr. McATEE. Well, while the fact that a project may have been labeled a demonstration project for the purpose of receiving financial assistance from DOE is not determinative of whether a project might be able to qualify for funding from the corporation as a synthetic fuel project. A synthetic fuel project must be for the purpose of commercial production of synthetic fuel. Now, what is the output at the end? Is it commercial production of synthetic fuel or is it something that is going to be abandoned? Those types of questions are ones that are asked and are responses that I have gotten when I have asked the exact same question that you have phrased.

Mr. YATES. It is important to this committee because we don't know what the extent of our funding is and where the funding should go. It is one thing to make money available for the development of synfuels at certain phases of development at the Synfuels Corporation and it is another thing to make funding available to the DOE, assuming that DOE will still continue to exist because the dirges have already begun for that establishment.

Mr. McATEE Yes, sir.

So where are we? We will just leave it there, won't we?

Mr. NOBLE. I do not know.

Mr. YATES. Apparently no one knows what Congress, in its wisdom, intended.

Mr. MURTHA. That seems to give the interpretation that they could be all right with a demonstration pilot project.

Mr. YATES. If the demonstration plant would turn out sufficient quantities of fuel to be commercial, if that is such a possibility—He says, "yes", Mr. Axelrod. Len says "yes". Sure he does. If that is true, then presumably it would qualify under your act, wouldn't it?

Mr. AXELROD. In the industry as in Congress, the demonstration plant is rather ambiguous, ambivalent.

Mr. YATES. Of course.

Mr. AXELROD. But the other terms are not.

Mr. YATES. Which other terms are not?

**Mr. Axelrod.** Process development unit, pilot plant, commercial plant.

**Mr. Yates.** I see.

**Mr. Axelrod.** Commercial plant——

**Mr. Yates.** Anything that sells things?

**Mr. Axelrod.** Well, it has to buy things in a market, it has to do some process. It has to sell things in a market profitably.

**Mr. Yates.** Yes. Is there any limit to the amount of output a demonstration plant may have?

**Mr. Axelrod.** For some things you can do this at a small size and be profitable. For other processes, the factors of scale——

**Mr. Yates.** It may turn out a lot and still be a demonstration plant? If your interpretation is correct, Mr. Axelrod, then the Chairman may want to review his statement that your act does not include demonstration plants.

**Mr. Axelrod.** I don't think so. Is that exactly what you said? I don't think so.

**Mr. Yates.** Yes. He said that does not include pilot or demonstration plants.

**Mr. Noble.** The law does say we should only use commercial plants. It does not define commercial plants, you are exactly correct. As a businessman I would say that the—if the cost of this plant, with all its costs included, can turn out a product which can compete in the marketplace, that it is a commercial plant.

**Mr. Yates.** Even if it is a demonstration plant. So, you may want to revise your answer, may you not? In other words you do know that pilot plants are not authorized for development under your act, but can you say that development plants are not authorized under your act? According to Mr. Axelrod you can't say that.

**Mr. Noble.** If you can turn out a product that can compete in the marketplace it would be a commercial plant. It does not matter the size of it. It could be ten barrels a day if the cost was low enough.

**Mr. Axelrod.** I think all that demonstration says is first time.

**Mr. Noble.** The definition is not clear, sir.

**Mr. Murtha.** I wonder too, if it is possible under the interpretation of the law for the Corporation to promote, on, say a 50-50 basis, the type of an installation where there is substantial Government investment. If so, some of the pilot projects that are due to be mothballed or closed down could be given the 50-50 opportunity and could save that investment.

**Mr. Yates.** Well, the problem isn't that the pilot plants are going to be closed down. The Department of Energy is going to be closed down. That is the real problem.

**Mr. Murtha.** That is a good point.

**Mr. Yates.** Don't you agree with that? Because presumably, there should be some place for Government assistance on pilot plants for new technologies. If the Department of Energy isn't that place, where are they to go? So, the Department of Energy should be retained. But that is not within your bailiwick, really; that is for us to think about.

**Mr. Noble.** No, sir, we have to deal with the law we have in front of us.

## FINANCIAL RESOURCES OF THE CORPORATION

Mr. **Yates**. You have enough problems, haven't you? Have you got adequate financial resources to reach the statutory production goals of 1987 to 1992? You have what, $35 billion I think, haven't you?

Mr. **Noble**. No, it is a little less than that, it is about $14.5. Yes, sir.

Mr. **Yates**. Is that enough?

Mr. **Noble**. To reach the production goals——

Mr. **Yates**. You said you are not going to reach them by 1987 to 1992 anyway.

Mr. **Noble**. Based on the present costs, we do not. But I do not know that that is the important factor. I think the important factor is to get the technology and infrastructure of people in place.

## ECONOMICS OF SYNTHETIC FUELS PRODUCTION

Mr. **Yates**. Could you give us any idea as to what it would cost to construct a plant to turn out 50,000 barrels of oil per day equivalent?

Mr. **Noble**. What type of plant?

Mr. **Yates**. Any kind of a plant. Fifty thousand barrels a day equivalent. How much would it cost?

Mr. **Schroeder**. In the area of $3.5 billion to $5 billion, sir. Mr. Axelrod has also indicated that these are national goals, and they are not dependent on simply those plants that we give assistance to. And there are some plants proceeding, or indicating that they are proceeding without Government assistance.

Mr. **Noble**. Mr. Chairman, my personal feeling is that the success of this program will depend on the ability to show that they are economically viable. And if so, then the private sector can go ahead and undertake these without assistance at some point.

Mr. **Yates**. Are there any companies that you know of, in the private sector, that are proceeding with this without Government help?

Mr. **Noble**. Exxon in their portion of the Colony project is proceeding without Government assistance.

Mr. **Yates**. That is the only one you know?

Mr. **Axelrod**. Tennessee Eastman.

Mr. **Yates**. Tennessee Eastman? Are those the only two you are aware of?

Mr. **Noble**. There are a number of companies, Standard of Indiana is going ahead with their research work without any request for assistance. They are doing it on their own.

Mr. **Axelrod**. As is Chevron.

Mr. **Schroeder**. Sohio and Gulf are also going ahead.

Mr. **Yates**. How much of your resources do you estimate you will be committing during 1982, if you have such a figure?

Mr. **Noble**. We have estimated $4.5 billion possible commitments. That will not be spent in 1982. In the 1983 monies, probably very little of it will be spent.

Mr. **Yates**. That means if you are lucky you won't have any outlays in 1982, right?

Mr. **Noble**. That is correct.

Mr. **Schroeder**. Other than administrative.

Mr. **Yates**. Or at any time.

Mr. **Noble**. Other than administrative and operating expenses.

Mr. **Yates**. It is kind of like preparing for nuclear war, isn't it?

Mr. **Noble**. We hope we have very little of this that has to be spent.

Mr. **Schroeder**. There are some outlays, Mr. Chairman, now being made by the Federal Financing Bank on behalf of the Colony project.

### FINANCIAL ASSISTANCE PHILOSOPHY

Mr. **Yates**. You are allowed 15 percent to each single company for assistance. What is the financial base that you will use to compute that percentage?

Mr. **Noble**. That is based on that original $20 billion appropriation. So that would mean a maximum assistance to any one program of $3 billion.

Mr. **Yates**. The chart we talked about a few minutes ago indicates you are going to have a third and fourth solicitation. Do you think you will have any resources left for those? Are you going to allocate resources?

Mr. **Noble**. Yes, sir, I think we will.

Mr. **Yates**. For all four solicitations? What if you find that you have very attractive projects in the first two solicitations which take up all your resources. Will you do those, and not have your third and fourth solicitations?

Mr. **Noble**. Again we are presuming on the votes of other people. I do not think, at this point, that there are enough projects ready, at this time.

Mr. **Yates**. Okay, then we won't worry about that.

Mr. **Noble**. We have made our budget estimates on what we—best judgment is all we can at this point.

### TOSCO AND UNION PROJECTS

Mr. **Yates**. Two of your big projects are TOSCO and Union Oil. Do you have the resources, both personnel and material, to oversee the development of these projects?

Mr. **Noble**. Those are not in place yet. Mr. Schroeder may want to comment on that.

Mr. **Schroeder**. The answer is yes, we are developing a team at this point. We do have the leadership of the team in place. As we become more familiar with the Colony project, we will probably need more people on the team. In the case of the Union project, we have a reduced problem, let's call it, of monitoring that process since Union is putting in its own money—but we do want information from the development of the process.

So, we will be gathering that information—following the development—as it goes along. The expenditure would come along as they produce from the plant.

### FIELD OFFICES

Mr. **Yates**. Have you proposed any field offices?

Mr. **Schroeder**. We do propose a field office in Colorado. That is a matter on the agenda for the Board to pass on this coming Board meeting. The recommendation is ready from the staff now concerning that. Oh, yes, I am reminded there may be others, but that is the only one we have planned at the present time.

### SMALL BUSINESS PARTICIPATION

Mr. **Yates**. Do you have any resources available for small and medium size businesses, or is it the nature of the projects that the small and medium size businesses cannot submit proposals?

Mr. **Noble**. The nature of the businesses are that they generally are large, but there are some smaller ones——

Mr. **Yates**. Smaller large ones?

Mr. **Noble**. First Colony, how big is that?

Mr. **Schroeder**. Well, it is not large, but the tar sands opportunities lends itself to smaller——

Mr. **Yates**. What size do you envision? What do you mean by small? I am not sure I even know what I mean by small when I ask you that question.

Mr. **Schroeder**. Well, small in relation to the other plants, would be multi-million dollar plants, not several billion dollar plants.

Mr. **Yates**. You are not talking about "small business" as it is usually understand?

Mr. **Schroeder**. No, not in the way it is customarily thought of in Government.

### BIOMASS

Mr. **Yates**. Do you think biomass ought to be included among the projects?

Mr. **Noble**. I would almost rather not. Biomass, I think, from what I have seen of it—and I am not a technician, I want to put that out front—we do know that certain parts of the biomass program can be economical, particularly in development of methane gas from garbage and that sort of thing. I got quoted a little bit out of context in that, I do support the future study of biomass, and it may be done totally in industry itself.

Some good scientists tell us that if they develop an enzyme, for instance, that will digest cellulose more quickly, that biomass from wood products can be economical. It is not at this moment an economical proposition.

Mr. **Yates**. I saw a documentary the other night about a garbage consuming plant in Manchester, England. It said the plant was turning out oil I think, at $15 a barrel.

Mr. **Noble**. They were using methane gas from garbage in Atlanta, Georgia, 25 years ago. So this is not really a new thing. The techniques, I think, are somewhat new. I will let Len comment on that part of it.

Mr. **Yates**. What do you mean they were using methane gas from garbage? Were they really; they were burning it?

Mr. **Noble**. Yes, sir, and generating power from it.

Mr. **Yates**. Why don't we do more of it?

Mr. **Schroeder**. That is a relatively typical fuel around sewage treatment plants to run the plant. That has been in place all of my life.

Mr. **Noble**. Len, maybe you ought to comment on this question.

Mr. **Yates**. Len, let me read to you from——

Mr. **Noble**. You might think about putting a price up for somebody that develops the right—puts the specifications on this enzyme, get some good scientific people. I am not one of them.

Mr. **Yates**. Well, couldn't you put up a couple of million bucks and still be money ahead?

Mr. **Noble**. The Gossimer project, this fellow that flew across the English Channel. Somebody estimated that to win that 20,000 pound prize, that there was something like $15 million worth of research that went on in various garages around the country to win the prize.

So, that enzyme question might be something that Congress could pay for a winner and not pay for any losers. But that is just a sort of off the cuff——

Mr. **Yates**. Let's look at what this says about Manchester. "High quality crude oil is being produced from Manchester's refuse in a pilot plant which designers claim is a major breakthrough in making synthetic fuel." Listen to that. I read from "The Times of London," dated February 25. "The plant designed by the University of Manchester Institute of Science and Technology transforms garbage into oil at the rate of ten tons of refuse to 26 barrels of oil. The process is believed to take only 5 to 10 minutes doing the work that has taken nature 150,000 years."

Well, that is short, isn't it? "Detailed cost analysis by the University and Greater Manchester Metropolitan Council which has contributed 500,000 pounds to the research." That is roughly $1.2 million, isn't it? Yes, "partly channeled through Salford University Industrial Center indicates that oil can be produced commercially at a cost of $15 a barrel." That is pretty good, isn't it? "This includes the estimated 20,000 pounds to build a fuel conversion plant. The council is expected soon to look for companies to build an operational refuse to oil conversion plant. Also preparing to alter one of its refuse handling plants to it can provide the Manchester University's Institute with lots of garbage."

Mr. **Noble**. Mr. Chairman, if that is correct, you won't need my help to do it because at $15 a barrel the private sector will jump on it very quickly.

Mr. **Yates**. I don't understand.

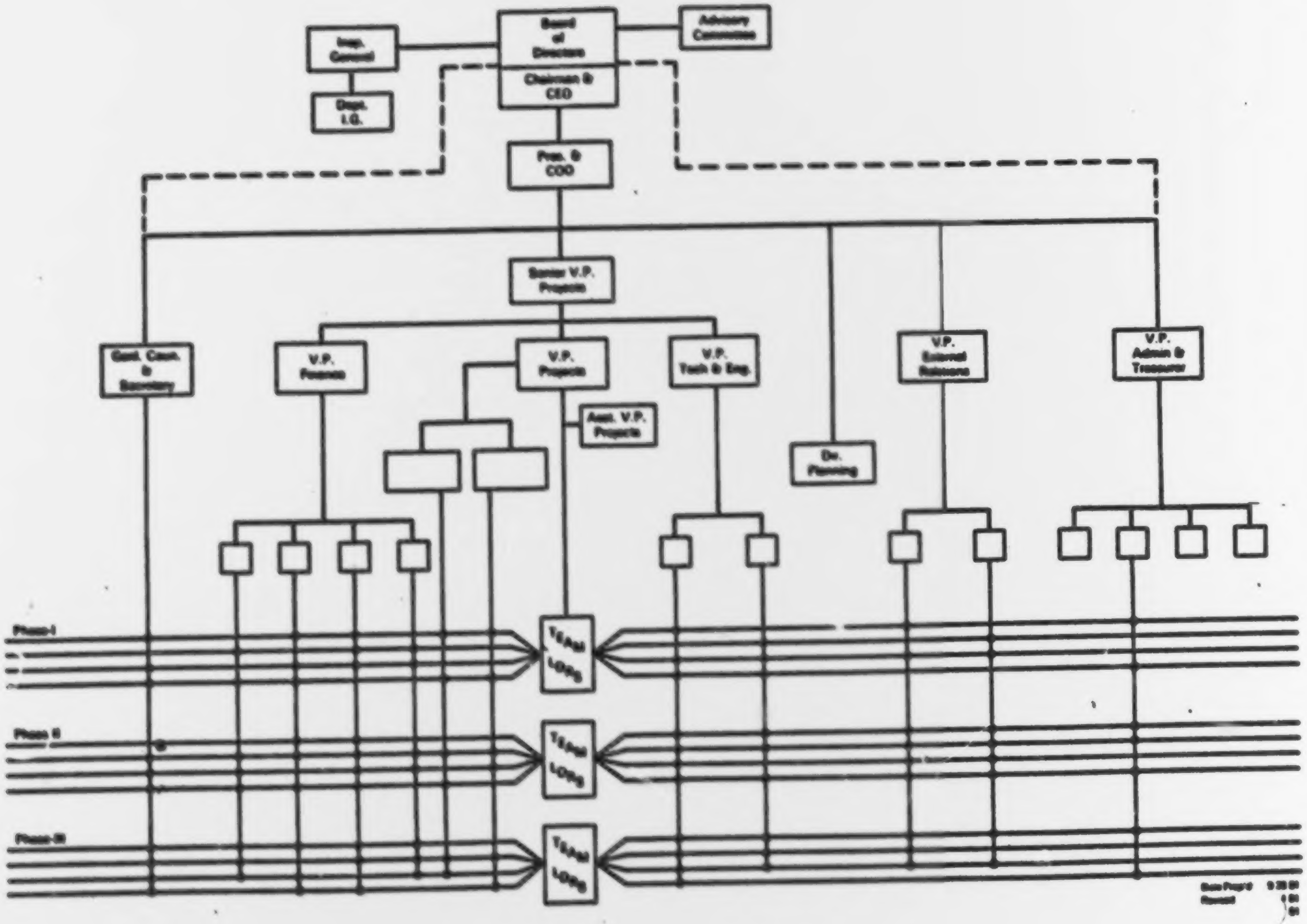
Mr. **Axelrod**. I would jump in to remind you of something. There is no question you can make oil from cellulose.

Mr. **Yates**. Sure. Baltimore has been trying to do it for years.

Mr. **Axelrod**. All you need to do is break up the molecules and add hydrogen. Under pressure with catalysts the reactions are the same whether it is shale, coal, oil, what have you. What I am reminded of is that what we well know from having done this many times for many years, that, is there is a growth curve in the estimated costs depending on the stage of the development of the technology.

At the stage you describe it is likely to be about 400 percent. Now we are up to $60 a barrel.

# Organization


Insp. General
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Board of Directors
Chairman & CEO
Advisory Committee
Pres. & COO
Senior V.P. Projects
Genl. Coun. & Secretary
V.P. Finance
V.P. Projects
Asst. V.P. Projects
V.P. Tech & Eng.
Dir. Planning
V.P. External Relations
V.P. Admin & Treasurer
Phase-I
TEAM LOG
Phase II
TEAM LOG
Phase-III
TEAM LOG

Mr. Yates. Right. Oh, for conversion, you mean?

Mr. Axelrod. Yes. This is what is typical of all of these proposed synthetic——

Mr. Yates. In your experience, Mr. Axelrod, you have seen improvements in technology which have resulted in lowerings of costs. Is it not possible that this university stumbled on something?

Mr. Axelrod. Oh, it is entirely possible.

Mr. Yates. Like Fleming who stumbled on penicillin? Isn't that possible?

Mr. Axelrod. That probably is not that possible.

Mr. Yates. Yes, it is not that possible. But isn't it possible, why would they, why would this university, knowing what you——

Mr. Axelrod. They don't know that.

Mr. Yates. Know what?

Mr. Axelrod. About the cost curve.

Mr. Yates. They know what is happening in the rest of the world. They know what the garbage plants are doing in the United States and Europe. Germany has been doing this for years haven't they?

Mr. Axelrod. Not making oil from refuse, only in laboratories.

Mr. Yates. Didn't the committee go over and see that in Germany?

Mr. Axelrod. On a commercial scale?

Mr. Yates. Yes. Baltimore has been trying to do it too.

Mr. Axelrod. You used a very essential word there.

Mr. Yates. Baltimore?

Mr. Axelrod. Trying.

Mr. Yates. Baltimore has a big plant but not great success.

Mr. Axelrod. They are burning it, aren't they, making steam to generate electricty?

Mr. Noble. Getty has done——

Mr. Axelrod. Almost everybody has worked at this.

Mr. Yates. One of us ought to go over and find out what they are doing, shouldn't we?

Mr. Axelrod. Well, perhaps those who have the responsibility for research and development should.

Mr. Yates. I am told the committee didn't see it in Germany. Well, at any rate, we ought to.

We have had people come before the committee and testify about different automobile engines that would provide 60 miles to the gallon.

It is still kind of interesting that they would make this announcement at this late stage, knowing what the oil situation is in the world and also knowing that Britain has a supply of oil it is selling to the world. It is interesting they would still come along and says this; it seems to me it is worthy of some kind of investigation.

So, we will investigate it.

### COMPUTER MODEL

What is the status of the computer model you are developing to assess engineering risks of projects?

Mr. Axelrod. It is operational.

Mr. **Yates**. Okay. Do you want to place in the record the advantages that would flow from the fact that it is operational? Will it be available for synfuel projects that are seeking funding from the Corporation?

[The information follows:]

### ADVANTAGES AND USES OF THE COMPUTER MODEL

The computer financial evaluation model developed internally to analyze the economic viability of projects seeking assistance. It is a powerful, flexible means of assessing inter-related project risks and benefits to both the government and project sponsors. It enables all projects to be analyzed on a deterministic or statiscal, probabilistic basis on an equal competitive basis. Moreover, it is believed to be among the most modern statiscally derived tools for financial analysis extant.

The advantages from utilization of such a model derive, in part, from an enhanced understanding of each project's economic performance in response to various cost, performance, technical, timing and economic assumptions. The Corporation's advantages are an increased ability to evaluate the need for a sharing of risks by the government and a qualification of the cost to the government of sharing those risks. Utilization of the model will permit the Corporation to estimate the optimum form and amount of financial assistance required for each project as well as the impact on the government of the Board's assistance decisions. Thus, the information from the model can be an integral part of the Corporation's negotiations with sponsors and financial institutions regarding the need for and efficiency of financial assistance to specific projects.

The analytic tools we are employing are not unique to the Corporation or to the government. The specific configuration, however, is unique. The Corporation does not intend to make its computer available for synfuels projects applying to the Corporation assistance, on the other hand, briefings of project sponsors will continue to occur regarding the results of and methodology employed in our computer-assisted analysis.

Mr. **Axelrod**. This is an economic model we are talking about.

Mr. **Yates**. Yes.

Mr. **Axelrod**. It is used in the analysis of the financial viability of the plants. It allows us to assess a great many scenarios on the basis of the probability of it happening and coming out with the probability of the kinds of results that you can expect under various conditions.

For instance, we have looked at how the results are affected not only by the technical risks, but by the problems of the sponsors in raising equity; how much equity they put in; what will happen to the project as a result of interest rates; changes in economics; and changes in inflation, for example. All these sensitivity analyses can be done very quickly and very effectively.

Mr. **Yates**. How much is it going to cost to develop this computer capability, have you any idea?

Mr. **Schroeder**. We estimate it will cost us a million dollars to develop the capability. We will probably refine that after we move along. Our contract is a task-oriented contract, so we assign different tasks as we develop those that have preceded it, make decisions on the value of those tasks and on the cost of them, and move on in the process. The computer capability is being developed for several things, Mr. Chairman. Not only for the analysis of projects, but also to contain our support numbers, our administration of the Corporation and to contain the history that we learn as we go through in preparation for writing the 1984 strategic plan.

### TRAVEL COSTS

Mr. YATES. The committee notices that your travel costs seem to be high. You are asking for $500 per month for each professional employee, $6,000 per employee per year. Is that reasonable?

Mr. SCHROEDER. Let me ask Dwight to respond to that.

Mr. INK. The numbers may be somewhat high, Mr. Chairman. We are concentrating, as the Chairman said earlier, on a small number of people in the organization, and those in the project area are going to be doing quite a bit of traveling. Our mid-year review which will take place in several weeks will look at this, particularly with respect to what we may contemplate in the way of some small field offices.

If we establish more small field offices, we expect that will cut down the amount of travel somewhat. But basically, we do expect it to be higher than would normally be the case if we are going forward with a small number of staff. We will have these projects, but we don't know where they are going to be located yet, Mr. Chairman. We don't know how many there are going to be. This travel estimate we look upon as a maximum. I do not say it was developed in a precise fashion. After we have made the project selection for not only the first solicitation, but after the second solicitation also comes in, we begin to see what the pattern of sites is going to be, we will have a much better estimate for the committee.

Mr. YATES. Okay.

### ADMINISTRATIVE EXPENSES

Mr. NOBLE. Mr. Chairman, I would like to add that our operating budget this year is roughly 45 percent of what we are allowed. Next year, fiscal year 1983, we anticipate it will only be about 65 percent of what we are allowed.

So, we do have areas like this where we are a little over but——

Mr. YATES. All right. Let's talk about the Hay Associates Study.

Mr. INK. May I add one comment?

Mr. YATES. Sure you may.

Mr. INK. Total adminstrative expenses add up to something less than one-half of one percent of our funds. I would suggest that is an extremely low overhead amount, Mr. Chairman.

Mr. YATES. How long do you propose to keep it that way?

Mr. INK. We do not expect to go above a half of one percent, Mr. Chairman.

### HAY ASSOCIATES STUDY

Mr. YATES. Let's talk about the Hay Associates Study. Did that study indicate that some of your benefits are unnecessarily generous?

Mr. INK. Mr. Chairman, the Hay Study indicated that in a few areas they were somewhat generous. It concluded that at the higher levels we were not competitive. So, at the lower levels of our salaries and in a few areas of relocation, they felt we were either right on the nose or, in a couple instances, overly generous.

And the result of those recommendations, there have been some modifications downward and some ceiling placed.

Mr. **Yates**. Would you put a statement——

Mr. **Noble**. The overall benefits are actually lower than the comparables in agencies at this point, I think.

Mr. **Ink**. They did not comment, they did not address the benefit package as a whole because that was not in their contract. What they did address were both the salary compensation and relocation benefits. I think that is what the chairman made reference to.

Mr. **Yates**. Would you place in the record the responses that the Board made to the recommendations of the Commission?

Mr. **Ink**. Yes, sir.

[The information follows:]

## BOARD OF DIRECTORS MEETING -- FEBRUARY 16, 1982

On a motion duly made by Mr. Monks and seconded by Mr. Wilkins the following resolutions were unanimously approved:

> WHEREAS, Section 117(b)(2) of the Energy Security Act authorizes the Board of Directors to fix the compensation of individual officer positions and categories of other employees of the Corporation taking into consideration the rates of compensation in effect under the Executive Schedule and the General Schedule prescribed in subchapters II and III of chapter 53 of title 5 of the United States Code for comparable positions or categories; and
>
> WHEREAS, by resolution of October 28, 1981, the Board of Directors authorized and directed the Chairman with the concurrence of the Compensation Committee to retain the services of an independent consultant to undertake a review of the salary structure and the relocation expense reimbursement policy of the Corporation, and directed the Compensation Committee, through the Chairman, to monitor, direct and review the work and recommendations of such consultant and to make recommendations to the Board of Directors based on the work of such consultant and such other factors as the Committee may deem relevant; and
>
> WHEREAS, the resolution of October 28, 1981, also directed the Compensation Committee to review other benefit plans of the Corporation and to make such recommendations to the Board of Directors with respect thereto as the Compensation Committee may deem appropriate; and
>
> WHEREAS, pursuant to such resolution, the firm of Hay Associates was retained and conducted such salary structure and relocation expense reimbursement policy reviews and has presented the results of its work to the Compensation Committee; and
>
> WHEREAS, based upon the Compensation Committee's review of such work such Committee has presented to the Board of Directors at this meeting a report setting forth its recommendations respecting certain salary categories, and the Corporation's relocation cost reimbursement policy and a merit pay plan; the report also sets forth certain recommendations with respect to the Corporation's other benefit plans; and
>
> WHEREAS, the Hay Associates review, the Compensation Committee, and the Board of Directors have also taken into consideration the rates of compensation in effect under the Executive Schedule and the General Schedule prescribed by subchapters II and III of chapter 53 of title 5 of the United States Code for categories of positions thereunder comparable to categories of positions of the Corporation; it is

RESOLVED, that the Board of Directors hereby declares that it is the compensation policy objective of the Corporation to comply fully with the provisions of Section 117(b)(2) of the Energy Security Act, and to establish, maintain and adjust, as necessary, maximum and minimum salary amounts for each category of exempt and nonexempt employees which take into consideration competitive requirements of the labor market and rates of compensation under the General and Executive Schedules prescribed by subchapters II and III of chapter 53 of title 5 of the United States Code and which are internally consistent and equitable; and further

RESOLVED, that consistent with the policy set forth in the above resolution of the Board of Directors and with the recommendation contained in the report of the Compensation Committee presented to this meeting the following salary categories for exempt and nonexempt employees of the Corporation be, and they hereby are, adopted:

Exempt Position Categories

| | | Minumum Salary | Maximum Salary |
|---|---|---|---|
| Entry Level Professional & Supervisory | EX-1 | $12,854 | $30,890 |
| Mid Level Professional & Entry Level Managerial | EX-2 | 30,891 | 48,927 |
| Upper Level Professional & Mid & Upper Level Managerial | EX-3 | 48,928 | 69,630* |

Nonexempt Position Categories

| | | Minimum Salary | Maximum Salary |
|---|---|---|---|
| Entry Level Clerical | NE-1 | $ 8,300 | $14,866 |
| Mid Level Clerical | NE-2 | 14,867 | 21,433 |
| Upper Level Clerical | NE-3 | 21,434 | 28,000 |

* Pursuant to Section 117(b)(2) of the Energy Security Act, if the Board of Directors determines that it is necessary to fix the compensation of any category of positions at a rate higher than that prescribed for Level I of the Federal Executive Schedule, the Board may transmit to the President of the United States its recommendations with respect to such rate of compensation.

; and further

RESOLVED, that in accordance with the recommendations contained in the report of the Compensation Committee presented to this meeting the Chairman will assign positions to their proper salary ranges within the salary categories established by the Board of Directors by means of formal job evaluation procedures; the salaries of individual employees will be established and adjusted within the salary ranges for their positions so as to recognize the qualifications and personal contributions of individual employees to the Corporation; and the Chairman may approve a salary for an individual which exceeds the maximum salary payable for the applicable salary category when it is necessary to do so to attract or retain an employee whose services are deemed necessary for the conduct of the Corporation's business; provided, that no salary rate which exceeds the salary of Level I of the Executive Schedule under section 5312 of title 5 of the United States Code shall be approved under this provision; and further

RESOLVED, that the Chairman be, and he hereby is, directed to take such action as may be necessary to insure that the salary of each present employee of the Corporation whose current salary is less than the minimum salary fixed by the salary schedule for his or her present position is increased to the minimum salary for such position effective immediately; and further

RESOLVED, that in accordance with the recommendation contained in the report of the Compensation Committee presented to this meeting, the Chairman be, and he hereby is, directed to take such action as may be necessary to insure that the salary of each present employee of the Corporation whose salary is more than the maximum salary for his or her position be adjusted, as determined by the Chairman, in subsequent merit increases at smaller increments than would otherwise apply, until the employee's salary is within the applicable salary range; and further

RESOLVED, that the merit pay and performance appraisal plan for 1982 recommended by the Compensation Committee of the Board of Directors in the report of the Committee presented to this meeting consisting of:

- o Salary adjustments for employees whose salaries do not exceed the maximum rate of the salary range of their positions, and who have not received a salary increase for one year.

- o Supplementary salary increases of up to a maximum of 4% in recognition of commendable or distinguished performance during the one year period preceding salary review.

- A prohibition against salary increases under merit pay provisions for employees whose performance has been below established standards.

- Restricting salary increases so that no salary will be payable at a rate higher than the salary rate for Level I of the Executive Schedule without full compliance with the requirements of section 117(b)(2) of the Energy Security Act.

be, and it hereby is, adopted; and that a plan containing substantially such provisions be implemented by the Chairman; and further

RESOLVED, that in accordance with the recommendations contained in the report of the Compensation Committee presented to this meeting, the provisions of the relocation cost reimbursement policy approved by the Resolution of the Board of Directors of December 22, 1980, be, and it hereby is, amended as follows:

- Househunting
  - reduce from maximum of 10 days to maximum of 7 days
- Temporary Living
  - reduce period from maximum of 60 days to maximum of 28 days
  - reduce to one per family roundtrips to former location during temporary living period
  - change expense allowance from $20 per person per day to reasonable cost
- Incidental Expenses
  - reduce from maximum of $3,000 to maximum of $1,500
- Eligibility for Allowances
  - reduce move radius from 50 miles to 35 miles
- Real Estate Broker's Commission
  - at the discretion of the Corporation, but not to exceed 6% of the sales price and in no event more than $10,000

- Lease cancellation rental expense not to exceed 2 months and $1,000 per month; and

that such policy be, and it hereby is, ratified and confirmed in all other respects; and that a relocation cost reimbursement policy containing substantially such provisions, as so amended, be implemented by the Chairman; and further

RESOLVED, that in accordance with the recommendations contained in the report of the Compensation Committee presented to this meeting the Chairman be, and he hereby is, directed to develop recommendations for other benefits for employees of the Corporation, such benefits to be at a cost to the Corporation less than the Federal Government's cost for such benefits, and to submit such recommendations to the Compensation Committee for its review.

### OFFICE SPACE

Mr. **Yates**. Do you get your office space through GSA?

Mr. **Ink**. Our office space? No, we did not. However we have, as we have gone along with space and furniture, been consulting with GSA.

Mr. **Yates**. GSA finds nothing objectionable in the rentals you are paying and the space you have taken on so far?

Mr. **Ink**. No. Now we did not go through them for formal clearance. But in the discussions with them, there have been no problems.

### ANNUAL REPORT OF THE INSPECTOR GENERAL

Mr. **Yates**. Has the Inspector General issued a report yet?

Mr. **Ink**. Yes, the Inspector General has issued a report.

Mr. **Yates**. Would you make a copy available to the committee?

Mr. **Ink**. Yes, sir.

[**Committee note**.—A copy of the November 30, 1981, "Annual Report of the Inspector General" was provide to the committee, and will be retained in the committee files.]

### ADMINISTRATIVE AND FILING FEES

Mr. **Yates**. What fees are you collecting at the present time, if any?

Mr. **Noble**. No.

Mr. **Yates**. No fees. All right. We have some questions for the record we would like answered.

[The question and answers follow:]

## RESPONSES TO COMMITTEE QUESTIONS

### Question #1

For the record, provide a listing of foreign synthetic fuels undertakings, including project cost, capacity, technology and operational status.

### Answer #1

Such a listing was recently prepared as an appendix to a staff briefing for the Board of Directors on "Strategic Matters," presented at the January 18, 1982 meeting. The list presented at that time is still appropriate and is attached as Exhibit I.

### Question #2

You inherited two oil shale projects from the Department of Energy, Tosco and Union Oil. Can you give us a status report on these two projects?

### Answer #2

UNION

The Union facility is being constructed in two phases:

- Phase I is a 10,000 BPD plant and is under construction.
- Phase II is expected to add 80,000 BPD in 20,000 BPD increments starting in 1986 and concluding in 1993.

Both phases include mining, retorting and upgrading of crude shale oil.

The project is on schedule with respect to engineering and construction progress. Union has spent well over one-third of the total estimated costs for Phase I of the project and has firm commitments for one-half of the project's total estimated costs of the first Phase. Union has responsibility for raising capital for construction and has thus far done so.

The cost estimate for the project has been refined as a function of increasing levels of detailed engineering. At present, the project is at a 70% detailed engineering status up from 10% when Union's application was submitted to DOE in late 1980.

Union has all necessary permits for Phase I and remains in compliance with such permits. Union has spent over $60 million for socioeconomic impact mitigation. The peak construction work force for the project will reach 1,800 this spring and Union has provided housing for 80% of this work force. The Corporation has been informed by local government officials that Union is doing a satisfactory job in the area of socioeconomic and environmental matters. Union has recently started the permit application process to expand their facility (Phase II) to 90,000 BPD. No federal financial assistance has been requested for the expansion.

Union has been cooperative in supplying monitoring data to the Corporation and is in compliance with the terms of the price guarantee and purchase commitment being administered by the Corporation.

COLONY

Colony Oil Shale Project is a partnership of the Tosco Corporation (40%) and of Exxon Company (60%), with no recourse for loan repayment to either of the Corporate partners. Most of the work to date on the Colony Shale Oil Project involves site preparation and project engineering. Site preparation includes grading and foundation work for major components of the plant; mine bench preparation; work on the access road to the site; excavation of conveyor tunnels and erection of dams. Increased costs have been incurred during site preparation. The erection of the first major component of the plant -- the primary crusher -- is planned in two months. Work is also underway on implementing socioeconomic impact mitigation plans.

The equipment procurement process is continuing as design and engineering work progresses. The current percentage of completion is conservatively estimated at approximately 8% - 9%. Refinement of cost estimates will be possible as detailed engineering is completed.

Question #2a

When do you expect production to begin?

Answer #2a

UNION

Production from the Union Project will begin in late 1983. Since the facility will be in a start-up mode for some months, the full rate of production at

10,000 BPD will not be reached until early 1984. Expansion plans for the project's second Phase call for an additional 80,000 BPD to be in place by 1993 assuming Phase I is successful.

COLONY

Commercial production from the Colony Project is expected to start in July, 1986.

Question #2b

What do you view as your oversight responsibility for these projects?

Answer #2b

UNION

The Corporation's responsibility with respect to the Union project is to monitor and implement the contract executed between DOE and the Union Oil Company. The Corporation is not obligated to make any price differential payments under the contract until synthetic fuel is produced. The formula provides, under certain energy prices, that the Corporation may also recoup any price differential payments. The Corporation has the responsibility to certify the quantity of fuel produced and the specifications. The Corporation is monitoring project costs, technical design progress, schedule and project compliance with permits. The information derived from this project will be valuable in determining the future prospects of other synthetic fuel facilities of a similar nature. Throughout construction and production operations, the Corporation is obligated to monitor Union's compliance with the contract terms.

COLONY

The Corporation's monitoring responsibilities for the Colony Oil Shale Project are to ensure compliance with the terms of the Agreement signed by The Oil Shale Corporation and the Department of Energy in 1981. The Corporation has accepted the responsibility for monitoring project design, construction cost estimates, operating cost estimates and project construction schedule, to determine how changes affect the economics of the project. Certain changes have occurred and the Corporation is in the process of evaluating their effect.

The Corporation must also verify progress on the project as determined by milestones included in the loan guarantee contract. The Corporation will verify that disbursements parallel the progress realized in engineering design and construction activities. The Corporation must also verify that all these disbursements cover eligible costs as defined in the loan guarantee agreement. The Corporation is required to review the drawdown schedules submitted by The Oil Shale Corporation every six months. These drawdown schedules indicate the maximum amount of government guarantees that can be borrowed under the agreement during the six-month period.

The Corporation must monitor compliance with environmental permit requirements, Davis-Bacon Act provisions, small business provisions, etc. Finally, the Corporation is responsible for implementing a monitoring system (including the necessary monthly, quarterly and annual reporting procedures included in the contract) in cooperation with The Oil Shale Corporation.

Question #3

Among the project selection criteria adopted is a "credit elsewhere" test. Could you explain to the Committee what this is and how you plan to implement it?

Answer #3

The "credit elsewhere" test is based on Section 131(r) of the Energy Security Act, which states that prior to providing loans, loan guarantees, joint venture assistance or a combination of forms of assistance including any of the foregoing, the Board of Directors must determine that adequate financing, on reasonable terms and conditions, is not available to the project absent Corporation assistance.

In making such determinations, the Corporation will apply a series of progressively more specific tests to each mature project and its sponsors. This process will include financial analysis and risk analysis. Project scale, complexity and degree of risk will be considered in evaluating each project's viability. The Corporation will implement the "credit elsewhere" test as follows:

Each project's economic viability and financial characteristics, including debt and equity requirements, in the absence of Corporation assistance, will be evaluated by the Corporation. The actual sponsors of the project will be analyzed to determine their estimated ability and willingness, as prudent investors, to fund their respective shares of estimated project capital costs, possible cost overruns and operating losses, in light of the risks and potential rewards involved.

In the event that the project appears attractive but the sponsors appear unable, prudently, to fund their respective shares during construction and operation, both the likelihood of expanding the project's sponsorship and the extent to which additional sponsors have been sought will be considered.

The ability of the project to attract sufficient debt financing from prudent lenders, on reasonable terms and conditions on an unassisted basis, also will be considered. Such financing may include co-financing or completion guarantees by the sponsor in order to minimize the level of assistance required of the Corporation.

If Corporation assistance is required to attract sufficient debt and equity capital on reasonable terms and conditions, the project will be analyzed further to determine the most appropriate form and minimize the amount of financial assistance required to see the project to completion and in operation.

For price guarantees, Section 134 of the Act requires that the Corporation establish the sales price "at the level which will provide the minimum subsidy determined by the Board of Directors to be necessary to provide an adequate incentive, in light of projected prices of competing fuels and the requirements for economic and financial viability of the synthetic fuel project." This test will require much the same analysis as Section 131(r), but the emphasis would be on product prices and project viability rather than on the availability of private capital.

Question #4

What kinds of information will you get that may help others enter the synthetic fuels market at a later date without government support?

Answer #4

The information of the greatest value to the emerging synthetic fuels industry will be that which is developed during the construction and operation of the projects receiving assistance from the Corporation. Sponsors of these projects will be encouraged to provide information to the public on such topics as experience gained during construction, technical developments and findings, insights into costs, and effectiveness of environmental and socioeconomic impact mitigation efforts. The information may best be characterized as "lessons learned" and will include all aspects of the projects which are not proprietary in nature. Also, much of the knowledge that will benefit later synthetic fuel development will lie in the experience of the people actually involved in the projects and in the technologies that must be available for license as a condition of Corporation assistance.

Question #4a

What mechanisms will you use to make this information available to private enterprise?

Answer #4a

The Corporation is developing a variety of methods to increase the availability and usefulness of the valuable information and experience from pioneering synthetic fuel projects. Appropriate project description, monitoring and performance information that is not classified as confidential may be available for public use. Fair access to proprietary technical information will be encouraged by provisions which require licensing of technology or know-how developed in the course of an assisted project under reasonable terms and conditions.

Traditionally, project sponsors have shared information through professional societies and associations. This practice will be encouraged by the Corporation. Other pertinent groups such as state and local officials, interested parties and research organizations will also contribute to the universe of data accumulated from project-related experience.

Question #5

You have formed a "study panel" of outside experts to advise you on economic and scientific issues. What are the economic and scientific issues this group will address?

Answer #5

The panel will be encouraged to offer its independent outside perspective on a broad range of economic and technical issues as part of the broader general input to the Corporation's planning and program development efforts. Emphasis and selection among possible issues will be determined by the panel. The Corporation's staff will provide background on suggested issues. Many of these issues have been outlined in recent staff briefings designed to apprise the

Board of Directors of program strategy matters under consideration. Program development issues often cut across technical and economic lines including such broad concerns as:

- Resource base potential, technology and diversity as they relate to programmatic considerations.
- National security concerns, energy market outlooks, state of the art and the developing synthetic fuel projects.
- Important technical and economic benefits from pioneering synthetic fuel projects including program implementation approaches for enhancing benefits.
- Environmental, socioeconomic concerns affecting near-term and long-term synthetic fuel industry prospects and water resource. (Emphasis will be placed on identifying priority issues, not analyzing specific technical details.)
- The effectiveness and practicality of alternative forms of financial assistance and solicitation strategies for achieving the Corporation's objectives.

Question #5a

How often will this panel convene?

Answer 5a

The Synthetic Fuels Study Panel is scheduled to meet only once - May 7 through May 10, 1982 in Washington, D.C.

Question #5b

Is the panel designed to supplement your own permanent staff?

Answer #5b

No, the panel is not supplementing permanent staff. The panel is one of many activities being undertaken by the Corporation to solicit and obtain the perspective of outside experts on important issues associated with the development of the Corporation's program and a synthetic fuels capability. The information and perspective provided by the panel may be used by the Corporation's staff in the course of program development.

Question #5c

What expenses are involved in the operation of the panel?

Answer #5c

The expenses of the panel are divided into several categories. The Corporation will pay the travel, hotel and meal expenses of the panelists. A small conference fee, or honorarium, will also be paid to each panel member in appreciation for their services.

Administrative Expenses .

The statement of administrative expenses is not very specific as to the level of environmental protection and monitoring by the Corporation.

Question #6

What do you see as your major environmentally-related responsibilities?

Answer #6

The Corporation has two major environmentally-related responsibilities. First, to review the sponsor's applications from the environmental perspective, with particular emphasis on regulatory compliance. The relevant environmental criteria are set forth in the Supplement to the Initial Solicitation. Second, to determine if environmental monitoring plans submitted by the sponsors (who must consult with certain state and federal agencies) are acceptable to the Board of Directors. (See Section 131(e) of the Energy Security Act).

Question #6a

What resources will you devote to this effort?

Answer #6a

Presently, the Corporation has six (6) professional staff members engaged in environmentally related work. Additional staff, either permanent or on a detailed basis, is being considered.

Question #6b

Is the Environmental Protection Agency involved in reviewing your projects? If so, what is their role?

Answer #6b

The EPA is not involved in reviewing projects proposed to the SFC. The EPA has no statutory responsibility to review project proposals on behalf of, or to provide advice to, the Corporation. However, under Section 131(e), the project sponsor is responsible for consulting with EPA regarding the sponsor's monitoring plan. Moreover, EPA may review the projects to the extent required by its permitting process.

Question #7

There has been controversy surrounding the salary structure at the Corporation. Do you now have a firm salary structure in place?

Answer #7

Yes, the present salary structure was approved by the Board of Directors on February 16, 1982. The resolution approving this salary structure is attached as Exhibit II. In addition, as indicated in Exhibit III, two Executive Level salaries recommended by the Board have not yet been resolved.

Question #7a

What are the top salaries paid to you and your employees?

Answer #7a

The salaries paid to the Chairman of the Board and officers as of April 2, 1982 are attached as Exhibit III.

Question #7b

How does this compare to industry? To government?

Answer #7b

The top salary in the government is Executive Level 1 - $69,630. Industrial salary ranges for comparable Corporation positions are attached as Exhibit IV.

## Developing Projects and Technologies

### COAL

United States of America

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Tennessee Eastman | 900 T/D commercial Plant to operate 1983 | Texaco | Synthesis gas for chemicals |
| 2. | Accurex | 24 T/D commercial in operation | Wellman-Galusha (atmospheric, fixed bed) | Low BTU gas |
| 3. | BSB | 130 T/D commercial in operation | Two stage atmospheric gasifier | Low BTU gas |
| 4. | Cando | 24 T/D commercial in operation | Two stage atmospheric gasifier | Low BTU gas<br>anthracite coal |
| 5. | Celanese | Commercial feasibility study | | Synthesis gas<br>Texas Lignite |
| 6. | Exxon | Commercial feasibility study | Lurgi | Texas Lignite |
| 7. | Phillips | Commercial feasibility study | Lurgi | Texas Lignite |
| 8. | ICRC | Demo design | SRC-1 plus hydrogenation | Direct liquefaction |
| 9. | Allis-Chalmers | Demo construction<br>1982 operation | Allis-Chalmers Kiln-Gas | Low BTU gas |
| 10. | TVA | 200 T/D Demo in startup | Texaco | Synthesis gas to ammonia |
| 11. | University of Minnesota | 72 T/D Demo in operation | Foster Wheeler Stoic<br>Two stage atmospheric gasifier | Medium BTU gas |

Exhibit I

es of America, cont.

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 12. | Exxon | 300 T/D Pilot in operation | Exxon Donor Solvent | Direct liquefaction |
| 13. | C.E. | Pilot in operation | C.E. Two stage entrained bed gasifier | Low BTU gas |
| 14. | DOW | Piloted: commercial in planning | Texaco-airblown | Low BTU gas |
| 15. | G.E. | Pilot in operation | Advanced fixed bed gasifier | Medium BTU gas |
| 16. | Bell | 10 T/D pdu in operation | High mass flux gasifier | |
| 17. | IGT | pdu in operation | Two stage gasifier | Peat |
| 18. | Rockwell/Cities | 20 T/D pdu in operation | Molten salt gasifier | Low BTU gas |
| 19. | Occidental | pdu in operation | Flash pyrolysis | Gas, liquid char |
| 20. | Exxon | pdu in operation | Catalytic fluid bed gasifier | Medium BTU gas |
| 21. | DOW | pdu complete | Catalytic direct liquefaction | |
| 22. | Dravo | Pilot | Coal-oil mixture | |
| 23. | Occidental | Commercial | Coal-oil mixture | |
| | **Australia** | | | |
| 1. | South Australia | Commercial feasibility study | | High BTU gas |
| 2. | NW South Wales/FRG | Commercial feasibility study complete 1984 | Direct vs. indirect liquefaction | |

Australia, cont.

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 3. | Victoria/FRG | Commercial feasibility study complete in 1984 | Rheinbraun direct liquefaction | Pilot plant in FRG |
| 4. | Australia Coal Corp. Ltd. | Commercial feasibility study planned | Lurgi plus Sasol synthol | Indirect liquefaction |
| 5. | Japan Coal Liq. Development Co. | 250 T/D pilot (in Japan) | Exxon Donor Solvent | Australian Coal |
| 6. | Mitsui Consortium | 5 T/D pdu (in Japan) | SRC type | Australian Coal |
| 7. | Nippon Brown Coal Liq. Co. | 50 T/D pdu (in Japan) to operate in 1984 | SRC type | Australian Coal |
| | **Brazil** | | | |
| 1. | | Commercial in design | B-W gasifier | Low & Medium BTU gas |
| 2. | Petrobras | Commercial in construction | Koppers-Totzek | Synthetic gas to ammonia |
| | **Federal Republic of Germany (FRG)** | | | |
| 1. | Texaco | Commercial planned operation 1985 | Texaco | Synthesis gas |
| 2. | KORF | Commercial planned operation 1985 | Saarberg/Otto molten slag bath | Reducing gas |
| 3. | V.E.W. | Commercial planned operation 1985 | air-blown gasifier | Low BTU gas |
| 4. | Ruhrkohle<br>Ruhrgas<br>Steag | 150 T/D Pilot testing | High pressure Lurgi | Planned commercial operation 1984 |
| 5. | Ruhrkohle<br>Ruhrchemie | 150 T/D Pilot testing | Texaco | Planned commercial operation 1985 |

Federal Republic of Germany (FRG), cont.

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 6. | Shell-Koppers | 150 T/D Pilot test complete | Pressurized, slagging entrained bed | Shell plans commercial operation 1985 |
| 7. | Rheinbraun | Pilot testing | High temperature Winkler | |
| 8. | Saarberg/Otto | 250 T/D Pilot testing | Molten Slag bath | |
| 9. | Ruhrkohle/Veba | 200 T/D Pilot testing | Catalytic direct liquefaction | German hard coal |
| 10. | KHD-Humbold | 240 T/D Pilot 1984 operation | Molten iron process | |
| 11. | Saarbergegewerke | 6 T/D pdu | Catalytic direct liquefaction | German hard coal |
| | Italy | | | |
| 1. | Fiat/Ansaldo/ Westinghouse | Demo 1986 operation | WestingHouse pressurized fluidized bed, agglomerating | |
| | Japan | | | |
| 1. | UBE | commercial | Texaco | Synthesis gas for ammonia |
| 2. | Sumitomo/ Kawasaki | 60 T/D pilot testing | Molten iron process | Commercial in planning |
| | New Zealand | | | |
| 1. | Government | Commercial | Methanol to gasoline | Natural gas fuel |

|  | Name | Status | Technology | Comments |
|---|---|---|---|---|
|  | **Poland** |  |  |  |
| 1. | Government | Commercial in design | Koppers-Totzek | MBTU gas |
| 2. | Government | Commercial operation 1984 | Koppers-Totzek |  |
|  | **Peoples Republic of China** |  |  |  |
| 1. | Government | Commercial in construction | Lurgi | Synthesis gas to ammonia |
|  | **South Africa** |  |  |  |
| 1. | AECIL | Commercial operation 1984 | High temperature Winkler | Synthesis gas to ammonia/methanol |
| 2. | SASOL II | Commercial in start-up | Lurgi plus Fischer-Tropsh (Synthol) |  |
| 3. | SASOL III | Commercial in construction | Lurgi plus Fischer-Tropsh (Synthol) |  |
| 4. | SASOL I | Demo in design | Westinghouse process | Synthesis gas |
| 5. | SASOL I | Pilot | SRC type process | Direct liquefaction |
|  | **Sweden** |  |  |  |
| 1. | Government Inst. | Pilot planned | High temperature Winkler | Peat |
|  | **United Kingdom** |  |  |  |
| 1. | British Gas | 300 T/D Pilot tested | Slagging Lurgi | Commercial planned |

**United Kingdom, cont.**

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 2. | National Coal Board | 25 T/D pdu | Critical gas extraction | Direct liquefaction |
| 3. | National Coal Board | 25 T/D pdu | Solvent extraction | Direct liquefaction |
| | **U.S.S.R.** | | | |
| 1. | Government | Commercial awarded | | Synthesis gas to methanol |
| 2. | Government (W. Siberia) | 300 T/D Pilot start construction 1982 | Hydrogenation | Direct liquefaction |
| 3. | Government (Moscow) | 10 T/D pdu operation 1983 | Hydrogenation | Direct liquefaction |

# Developing Projects and Technologies

## SHALE

### United States of America

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Phillips | 1000 T/D Demo in design | IGT Hytort | Eastern Shale |
| 2. | TOSCO (Sand wash) | Commercial feasibility study | TOSCO | |
| 3. | Southern Indiana Shale Company | Commercial feasibility study planned | Technology not selected | Eastern Shale |
| 4. | Chevron | 300 T/D Pilot in design | Staged tubular bed retort | Commercial 1988?<br>1 T/D pdu testing |
| 5. | Dravo | Pilot testing | Rotary Grate retort | |
| 6. | Shell | Pilot testing | Fluid bed with pellet heat exchanger | |
| 7. | IGT | Pilot testing | Hytort<br>pressure retort with Hydrogen | |
| 8. | Geokinetics | Field test | Horizontal in-situ | |
| 9. | Equitable Oil | Field test | Steam injection | |

### Australia

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Exxon/Sopacpetr/ Cent. Pac. Mining | Field exploration | Technology not selected | Commercial<br>5 - 10 years |
| 2. | Japan Australian Shale Co. (Condor Shale Project) | Feasibility study 1983 | | |

Australia, cont.

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 3. | CSR Ltd. | ½ T/D pdu construction | | Commercial 10 years |
| | **Brazil** | | | |
| 1. | Petrobras | Commercial in construction operation 1986/87 | Petrosix (similar to Paraho) | |
| | **Canada** | | | |
| 1. | AOSTRA | Field test | Steam and solvent injection | |
| | **Federal Republic of Germany** | | | |
| 1. | Lurgi | Pilot testing | L.R. Process fluidized spent shale leating | |
| | **Israel** | | | |
| 1. | Government Inst. | Field test | Fire flood with laser ignition | |
| | **Jordan** | | | |
| 1. | Government | Pre-pilot study | L.R. Process | |
| 2. | Government | Pre-pilot study | USSR Direct combustion | |

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| | **Morocco** | | | |
| 1. | Government | Pilot planned | T-cubed | Commercial 1986 |
| 2. | Government | Pilot planned | Shell | Commercial 1990's |
| 3. | Government | Field survey | TOSCO | |
| | **Yugoslavia** | | | |
| 1. | Government | 3 T/D pdu | Swedish retort | Will also try in-situ |

Exhibit II

## RESOLUTION APPROVED BY THE SYNTHETIC FUELS CORPORATION BOARD OF DIRECTORS ON FEBRUARY 16, 1982

RESOLVED, that the Board of Directors hereby declares that it is the compensation policy objective of the Corporation to comply fully with the provisions of Section 117(b)(2) of the Energy Security Act, and to establish, maintain and adjust, as necessary, maximum and minimum salary amounts for each category of exempt and nonexempt employees which take into consideration competitive requirements of the labor market and rates of compensation under the General and Executive Schedules prescribed by subchapters II and III of chapter 53 of title 5 of the United States Code and which are internally consistent and equitable; and further

RESOLVED, that consistent with the policy set forth in the above resolution of the Board of Directors and with the recommendation contained in the report of the Compensation Committee presented to this meeting the following salary categories for exempt and nonexempt employees of the Corporation be, and they hereby are, adopted:

Exempt Position Categories

| | | Minimum Salary | Maximum Salary |
|---|---|---|---|
| Entry Level Professional & Supervisory | EX-1 | $12,854 | $30,890 |
| Mid Level Professional & Entry Level Managerial | EX-2 | 30,891 | 48,927 |
| Upper Level Professional & Mid & Upper Level Managerial | EX-3 | 48,928 | 69,630* |

Nonexempt Position Categories

| | | Minimum Salary | Maximum Salary |
|---|---|---|---|
| Entry Level Clerical | NE-1 | $ 8,300 | $14,866 |
| Mid Level Clerical | NE-2 | 14,867 | 21,433 |
| Upper Level Clerical | NE-3 | 21,434 | 28,000 |

* Pursuant to Section 117(b)(2) of the Energy Security Act, if the Board of Directors determines that it is necessary to fix the compensation of any category of positions at a rate higher than that prescribed for Level I of the Federal Executive Schedule, the Board may transmit to the President of the United States its recommendations with respect to such rate of compensation.

; and further

RESOLVED, that in accordance with the recommendations contained in the report of the Compensation Committee presented to this meeting the Director of Personnel will assign positions to their proper salary ranges within the salary categories established by the Board of Directors by means of formal job evaluation procedures; the salaries of individual employees will be established and adjusted within the salary ranges for their positions so as to recognize the qualifications and personal contributions of individual employees to the Corporation; and the Chairman may approve a salary for an individual which exceeds the maximum salary payable for the applicable salary category when it is necessary to do so to attract or retain an employee whose services are deemed necessary for the conduct of the Corporation's business; provided, that no salary rate which exceeds the salary of Level I of the Executive Schedule under section 5312 of title 5 of the United States Code shall be approved under this provision; and further

RESOLVED, that the Chairman be, and he hereby is, directed to take such action as may be necessary to insure that the salary of each present employee of the Corporation whose current salary is less than the minimum salary fixed by the salary schedule for his or her present position is increased to the minimum salary for such position effective immediately; and further

RESOLVED, that in accordance with the recommendation contained in the report of the Compensation Committee presented to this meeting, the Chairman be, and he hereby is, directed to take such action as may be necessary to insure that the salary of each present employee of the Corporation whose salary is more than the maximum salary for his or her position be adjusted, as determined by the Chairman, in subsequent merit increases at smaller increments than would otherwise apply, until the employee's salary is within the applicable salary range; and further

Exhibit III

## SFC OFFICERS

(as of 4/2/82)

| Name | Title | Current Annual Salary |
|---|---|---|
| Edward E. Noble | Chairman | $ 0** |
| *Victor A. Schroeder | President | 69,630 |
| Dwight A. Ink | V.P.-Administration | 65,000 |
| Wm. R. Rhatican | V.P.-External Relations | 69,630 |
| Ralph Bayrer | Deputy V.P.-Projects | 65,551 |
| Neil Eisner | Act. Chief Financial Officer | 69,630 |
| Edward F. Cox | General Counsel | 53,500 |
| Charles A. Cowan | V.P.-Projects | 69,630 |
| *Len Axelrod | V.P.-Technology & Engineering | 69,630 |
|  | Inspector General |  |

* The Board of Directors approved on March 26, 1982, annual salaries of $135,000 for the President and $108,000 for the Vice President-Technology and Engineering subject to review by the President of the United States in accordance with Section 117(b)(2) of the Energy Security Act of 1980.

** Mr. Noble is serving without salary.

## CLOSING REMARKS

Mr. YATES. Any specific problems you want to tell us about before we give you our blessing and say "thank you"?

Mr. NOBLE. I think the biggest problem, which we have already discussed, is the question of being able to bring just a very few really excellent people on board.

Mr. YATES. Good luck.

Mr. NOBLE. That is the whole name of the game—people.

Mr. YATES. That is the name of the game—people. Right. Good luck.

Thank you very much.

[Whereupon at 12:30 p.m. the hearing was adjourned.]

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MONDAY, APRIL 26, 1982.

# DEPARTMENT OF ENERGY, STRATEGIC PETROLEUM RESERVE, NAVAL PETROLEUM AND OIL SHALE RESERVES, AND EMERGENCY PREPAREDNESS

## WITNESSES

**WILLIAM A. VAUGHAN, ASSISTANT SECRETARY, ENVIRONMENTAL PROTECTON, SAFETY, AND EMERGENCY PREPAREDNESS**

**RONALD L. WINKLER, DEPUTY ASSISTANT SECRETARY FOR ENERGY EMERGENCIES**

**RICHARD D. FURIGA, DEPUTY ASSISTANT SECRETARY FOR THE STRATEGIC PETROLEUM RESERVE**

**CAPT. GORDON R. GILMORE, USN, DIRECTOR OF NAVAL PETROLEUM AND OIL SHALE RESERVES**

## OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order.

This is a hearing on appropriations for fiscal year 1983 for three activities, the first is the Strategic Petroleum Reserve, the second is Naval Petroleum and Oil Shale Reserves, and the third is Emergency Preparedness.

Appearing in support of those appropriations is Mr. William A. Vaughan, who is the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness.

He is supported by Mr. Ronald L. Winkler, Deputy Assistant Secretary for Energy Emergencies; Richard D. Furiga, Deputy Assistant Secretary for the Strategic Petroleum Reserve; and Captain Gilmore, Director of Naval Petroleum and Oil Shale Reserves.

We have had the pleasure before, Mr. Gilmore, haven't we?

Captain GILMORE. Yes, sir.

Mr. YATES. There may go into the record at this point the biographies of Mr. Vaughan, Mr. Winkler, Mr. Furiga, and Captain Gilmore.

[The biographies follow:]

U.S. Department of Energy
Assistant Secretary for
Congressional, Intergovernmental
and Public Affairs
Office of Public Affairs
Washington, D.C. 20585
202/252-5644

# BIOGRAPHY

## WILLIAM A. VAUGHAN

William A. Vaughan was nominated by the President on June 15, 1981, and confirmed by the Senate on September 18, 1981, as Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness, U.S. Department of Energy (DOE). In this position, Mr. Vaughan is responsible for ensuring that the Department's programs are in accord with national environmental, health, and safety regulations. In addition, he directs DOE's energy emergency and contingency planning efforts and has responsibility for the Naval Petroleum Reserves, the Oil Shale Reserves, and the Strategic Petroleum Reserve.

Mr. Vaughan has been Director, Energy Management, Manufacturing Staff, for General Motors Corporation (GM), since 1976. From 1971 until 1976, he was Attorney-in-Charge, Environmental and Energy Law Section. Mr. Vaughan joined GM's Legal Staff as an attorney in 1970. During his tenure with GM, he taught courses in environmental law and energy law at the University of Detroit.

From 1960 to 1970, Mr. Vaughan was on the faculty of Virginia Military Institute (VMI), initially as an instructor and then as an Assistant Professor of Civil Engineering. During the period 1964 to 1967, he served as Deputy Commandant of Cadets at VMI. He currently holds the rank of Lieutenant Colonel in the U.S. Army Reserves, having served on active duty from 1957 to 1960.

Mr. Vaughan received a B.S. degree in civil engineering with honors from VMI in 1957, an M.S. degree in civil engineering from Purdue University in 1964, and a J.D. degree, magna cum laude, from Washington & Lee University Law School in 1970. He was Editor-in-Chief of the Washington & Lee Law Review and a member of the Order of the Coif.

He is a Registered Professional Engineer in Virginia and is a member of the Engineering Society of Detroit and American and Michigan Bar Associations. Mr. Vaughan was also a member of the Energy Steering Group and Chairman of the Coal Utilization Subcommittee for the National Association of Manufacturers, on the Steering Committee for the Process Gas Consumers Group, served on the Energy Council for the American National Standards Institute, and has represented GM on the Electricity Consumers Resource Council. He was named "Man-of-the-Year" by Modern Industrial Energy magazine in May 1980.

Mr. Vaughan was born in Richmond, Virginia. He is married and has three children.

October 1981

U.S. Department of Energy
Assistant Secretary for
Congressional, Intergovernmental
and Public Affairs
Office of Public Affairs
Washington, D.C. 20585
202/252-5844

# BIOGRAPHY

## RONALD L. WINKLER

Ronald L. Winkler was appointed Deputy Assistant Secretary for Energy Emergencies, Office of Environmental Protection, Safety, and Emergency Preparedness, U.S. Department of Energy (DOE) on September 28, 1981. He is responsible for a coordinated national program of energy contingency planning and emergency preparedness. This new program is part of the Reagan Administration's commitment to minimize the adverse effects of any future oil supply disruption by helping to facilitate the free market's operation. In addition, the Office of Energy Emergencies provides leadership within the Federal Goverment for

- greater public understanding of the Nation's requirements for energy emergency preparedness;
- strengthening the partnership between the private sector and all levels of government in preparing for and responding appropriately to any future energy emergencies;
- facilitating the ability of the free market to ensure, during any future energy emergency, the continuation of adequate and timely supplies of petroleum, gas, solid fuels, and electricity; and
- meeting national defense energy needs.

Prior to joining DOE, Mr. Winkler was a partner with the Washington law firm of Sutherland, Asbill & Brennan. In his more than nine years with the firm, he had a wide range of experience in many facets of national energy policy, including natural gas, petroleum, and electricity pricing and supply; coal conversion and alternate fuel technologies; state and Federal conservation programs; and energy emergency preparedness and organization planning.

A graduate of Duke University (A.B., 1969) and Duke Law School (J.D., 1972, with distinction), Mr. Winkler holds numerous bar memberships including the United State Supreme Court. He is author or co-author of a number of publications on fuel supply, energy and environmental law, computers and data security, and electronic fund transfers.

Mr. Winkler, who was born in New York City in 1948, lives in Rockville, Maryland, where he is active in community affairs. He and his wife, Carolyn, have three children.

November 1981

## Developing Projects and Technologies

## TAR SANDS/HEAVY OIL

### United States of America

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Conoco | Field test | Fracture assisted steam drive | |
| 2. | IITRI | Field test | Radio freq. heating | |
| 3. | Enercor | Pilot test | Alkalized hot water | |
| 4. | Getty | Pilot test | Lurgi L.R. | |
| 5. | Getty | Pilot test | Dravo solvent extraction | |
| 6. | SOHIO | Pilot plant study | Sodium carbonate - hot water | |
| 7. | Natomas | Feasibility ('89) | Proprietary | |

### Canada

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Cold Lake (Exxon) | Commercial, on hold | Mining - hot water - coking | |
| 2. | Alsands (Shell) | Commercial, on hold | In-situ steam stimulation flexi coking | |

### Federal Republic of Germany

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Lurgi | pdu test | Donor solvent hydrovisbreaking | |

### Venezuela

| | Name | Status | Technology | Comments |
|---|---|---|---|---|
| 1. | Lagoven | Commercial contracted | Lummus | |

Exhibit IV

| Position | | Industrial Average | | |
|---|---|---|---|---|
| | | Min | Mid | Max |
| Chairman | | 142,646 | 178,307 | 213,968 |
| President | | 122,910 | 153,637 | 184,364 |
| Sr. VP - Projects | | 84,604 | 105,755 | 126,906 |
| VP - Projects | | 67,969 | 84,961 | 101,953 |
| General Counsel | | 65,009 | 81,261 | 97,513 |
| VP - Administration | | 65,009 | 81,261 | 97,513 |
| VP - Finance | | 65,009 | 81,261 | 97,513 |
| VP - Tech. & Engineering | | 62,254 | 77,817 | 93,380 |
| VP - External Relations | | 52,762 | 65,953 | 79,144 |
| Inspector General | | 59,396 | 74,245 | 89,094 |

U.S. Department of Energy
Assistant Secretary for
Congressional, Intergovernmental
and Public Affairs
Office of Public Affairs
Washington, D.C. 20585
202/252-5844

# BIOGRAPHY

## RICHARD D. FURIGA

*Mr. Furiga is currently serving as Deputy Assistant Secretary for the Strategic Petroleum Reserve (SPR). He has been with the Department of Energy's SPR Program since August 1977. Until assuming his present responsibilities on January 9, 1982, Mr. Furiga served as Deputy Director of the SPR.*

*Mr. Furiga was an officer in the U.S. Navy from 1957 to 1977. His assignments included management positions in the petroleum logistics field, such as Director, Navy Energy Office and Director, Technical Operations, Navy Petroleum Office.*

*Mr. Furiga was born June 20, 1935, in New Eagle, Pennsylvania. He graduated from the U.S. Naval Academy in 1957 with a Bachelor of Science Degree in Engineering. He received a Master of Science Degree in Petroleum Management from the University of Kansas in 1972 and is a member of the Society of Petroleum Engineers.*

*Mr. Furiga is married to the former Janet Marie Pietroboni.*

*January 1982*

U.S. Department of Energy
Speakers Bureau
Office of Public Affairs
Washington, D.C. 20585
202/252-5544

# BIOGRAPHY

## CAPTAIN GORDON R. GILMORE, U.S. NAVY

Captain Gordon R. Gilmore is the Director, Naval Petroleum and Oil Shale Reserves, within the Office of Environmental Protection, Safety, and Emergency Preparedness, U.S. Department of Energy (DOE). He is responsible for management of the Naval Petroleum Reserves in California and Wyoming and the Naval Oil Shale Reserves in Colorado and Utah.

Prior to reporting to the DOE for duty in June 1980, Captain Gilmore had served as Officer in Charge of Construction to develop the Elk Hills Naval Petroleum Reserve. A career naval officer, Captain Gilmore's other previous assignments have included duty in Japan, Vietnam, Thailand, Cambodia, and various locations in the United States including two previous tours with the Naval Petroleum Reserves.

Captain Gilmore holds a B.S. degree in petroleum engineering and an M.A. degree in management. He is a registered professional engineer. Captain Gilmore is the recipient of numerous awards including the Navy Marine Corps Medal, Bronze Star Medal with Combat V, three Meritorious Service Medals, and the Cambodian National Defense Medal. He was named as one of the Outstanding Young Men of America in 1968.

A native of Texas, Captain Gilmore currently resides in Great Falls, Virginia with his wife Donna and their three boys.

April 1981

**Mr. Yates.** The biographies may be followed by the statement of Secretary Vaughan.

[The statement of Mr. Vaughan follows:]

# Statement of William A. Vaughan
Assistant Secretary, Environmental Protection,
Safety, and Emergency Preparedness
Department of Energy
Before the
Committee on Appropriations
Subcommittee on Interior and Related Agencies

## INTRODUCTION

Mr. Chairman and members of the Subcommittee, it is my pleasure to appear before you today in support of the President's budget proposals for FY 1983 for the Office of Energy Emergencies, the Strategic Petroleum Reserve, and the Naval Petroleum and Oil Shale Reserves. The Department's energy emergency preparedness responsibilities are centered in these three program offices under my direction. I am accompanied this morning by Mr. Ronald L. Winkler, the Deputy Assistant Secretary for Energy Emergencies; Mr. Richard D. Furiga, the Deputy Assistant Secretary for the Strategic Petroleum Reserves; and Captain Gordon R. Gilmore, USN, Director of the Naval Petroleum and Oil Shale Reserves.

Before going into the specific budget requests for each of these offices, I would like to take a moment to discuss our approach to energy emergency preparedness.

The overriding goals of the Department's energy emergency preparedness program are to reduce the Nation's vulnerability to energy supply disruptions and to mitigate their impacts on the Nation. This Administration has redefined significantly our method of achieving this. We have abandoned the policy of extensive Federal intervention such as oil allocation, price controls, and mandatory demand restraint measures, because we found they created or exacerbated the adverse economic and social impacts.

Our strategy to achieve these goals is to rely primarily on the marketplace to respond to disruptions in energy supplies and to fill the Strategic Petroleum Reserve. Accordingly, we seek to remove barriers to short-term adjustments in the marketplace. Since the basic problem of a major energy supply disruption is the economy's difficulty in adjusting rapidly, one useful solution is to develop adequate crude oil stocks that can be drawn down in an emergency. Both private and Government-owned stocks are effective in dealing with oil supply disruptions, associated economic losses and national security threats. For the United States, protection against severe disruptions in petroleum supplies includes the Strategic Petroleum Reserve. In addition to our commitment to the SPR, we want to encourage the buildup of private stocks by suppliers and large consumers before an emergency, and we are working to remove disincentives for private stockbuilding. The Naval Petroleum Reserves are also producing at the maximum efficient rate and will sell the Government's share of production to the Department of Defense to aid them in establishing secure sources of supply.

Stimulating public understanding of the need to plan for energy emergencies and to facilitate effective communications during crises is another program priority. An important part of this effort is to encourage suppliers, consumers, and State and local governments to develop their own contingency approaches. Also, we are working closely with the International Energy Agency (IEA) to develop coordinated responses among the 21 members during a major supply disruption.

The balance of my testimony provides pertinent details of the Energy Emergencies Program, the Strategic Petroleum Reserve, and the Naval Petroleum and Oil Shale Reserves.

## ENERGY EMERGENCIES PROGRAM

Our energy emergency strategy relies primarily on market mechanisms, coupled with self-help and liaison programs. In this way, we will facilitate free market responses to energy emergencies, and coordinate energy emergency planning. Because energy is critical to U.S. national security and defense needs, our planning also assesses vulnerability to terrorism and sabotage of the Strategic Petroleum Reserve, the Naval Petroleum and Oil Shale Reserves, the electric utility network, natural gas and petroleum pipelines, and other parts of the energy system. We have other on-going programs to improve energy emergency preparedness, including participation in the Emergency Mobilization Preparedness Board.

## ORGANIZATION

The Office of the Deputy Assistant Secretary for Energy Emergencies develops emergency preparedness strategies and programs to reduce U.S. vulnerability to energy supply disruptions. Its two components are the Offices of Energy Contingency Planning and Energy Emergency Operations.

The Office of Energy Contingency Planning develops new initiatives, analyzes energy emergency issues, develops and tests emergency responses, and evaluates the probable consequences of such responses for other nations, Federal and State governments, industry, and individuals. The names of the Office's two Divisions describe their functions: Plans Development and Testing, and Scenario Development and Response Strategy Analysis.

The Office of Energy Emergency Operations monitors, reviews and analyzes data about energy resources as they relate to possible emergency situations, determines the imminence and potential magnitude of a shortage, and assesses its resulting impacts. The names of its two Divisions describe their main functions: National Security and Emergency Operations, and Energy Supply Evaluation and Risk Assessment.

## FY 1982 ACTIVITIES AND ACCOMPLISHMENTS

Some of the highlights of FY 1982 activities and accomplishments are as follows:

Enhancing Supplies. We are responsible for various planning activities with respect to the Strategic Petroleum Reserve and the Naval Petroleum Reserves. Accordingly, we are developing an SPR Distribution Management Manual which identifies logistical, legal, and managerial requirements to distribute and use crude oil from the SPR. We are also evaluating and developing alternate drawdown approaches for SPR use in potential crises. To encourage private stocks we are evaluating options to eliminate disincentives, and studying possible incentives which might be appropriate.

Mitigating Impacts. Since we support U.S. involvement in the International Energy Agency, we are developing contingency plans for a National Emergency Sharing Organization and a mechanism to backstop voluntary offers by U.S. oil companies should the IEA emergency system be triggered. We are also developing plans for U.S. participation in the IEA's Allocation System Test-4 in the spring of 1983. Another project examines financial and economic impacts of energy supply disruptions, and the feasibility of recycling selected revenues.

Developing Essential Information. To meet statutory requirements or to fulfill our public responsibilities in emergencies, it is essential for the Department to analyze and disseminate certain information. For this reason we are developing a public information plan which will lead to greater public understanding of the need for energy emergency preparedness before a crisis occurs, and which will provide effective communications during a crisis. We are also developing and refining a daily energy situation report--an "early warning" system to provide accurate and timely assessments of domestic and international energy markets and conditions. In addition, we are developing a rapid information retrieval and analytical capability utilizing EIA data and expertise.

Coordinating With Other Agencies, States and Localities, and the Private Sector. Government cannot and should not attempt to accomplish the emergency preparedness task alone. To obtain needed industry expertise in planning for and responding to energy emergencies, we are considering the revitalization of the long dormant Executive Manpower Reserves--the Emergency Electric Power Reserve, the Emergency Petroleum and Gas Reserve and the Emergency Solid Fuels Reserve. The Reserves will provide a role for both energy producers and consumers as well as for State and local governments, financial institutions, and other businesses, on a volunteer basis, without establishing a permanent bureaucracy.

In addition to the Manpower Reserves programs, we have a responsibility to coordinate our activities with other State and local governments as well as with other Federal agencies. To facilitate communication, we maintain the DIALCOM electronic mail system with most States, the Regional Electric Reliability councils, energy associations and their regional and state affiliates.

Supporting Defense Preparedness. Several plans to support defense preparedness are under development, including National Oil Board plans to support the U.S. commitment to the NATO Civil Emergency Planning Organization and the NATO Wartime Oil Organization. We are also developing plans to implement the Defense Production Act Requirements to ensure energy supplies for defense needs.

Conducting Tests. We are planning for and testing various programs, including: IEA preparedness for energy emergencies, civil emergencies, military traffic, and Continuity of Government. We have just finished testing our Continuity of Government Plan and are preparing to test the Strategic Petroleum Reserve draw down management process.

## FY 1983 EMERGENCY PREPAREDNESS BUDGET

The FY 1983 budget request for the Office of Emergency Preparedness is $5.4 million, a decrease of $4.8 million from the FY 1982 appropriation.

During FY 1983, our emphasis will be to enhance FY 1982 planning and operating readiness initiatives so we can assess national security needs and identify necessary responses during an energy emergency.

To carry out these objectives, the program will maintain and improve upon in-house expertise for planning and operations, thereby reducing the need for outside contract support.

Operating expenses for Emergency Planning are $840,000, down $2,010,000 from the $2,850,000 appropriated for FY 1982. This appropriation will permit us to address practical energy emergency problems, develop new responses, and analyze policy issues surrounding energy supply emergencies, consistent with the Administration's market-based energy approach. Another emphasis is our support for voluntary U.S. company participation in the IEA oil sharing program during emergencies. We will also be involved with NATO-related planning for oil supply and distribution and will develop scenarios to profile potential emergencies and develop and test appropriate responses.

Our FY 1983 request for operating expenses for Emergency Operations is $1,300,000, $2,050,000 less than the $3,350,000 appropriated the year before. Such an appropriation will allow us to implement defense programs and prepare to coordinate communications and operations during energy emergencies. Thus we will focus on programs to provide accurate and timely information to State and local governments and the general public. Where possible, we shall use existing capabilities such as interagency support agreements and Federal/State coordination mechanisms.

The balance of this request includes $3,300,000 for program direction costs, representing salaries and other expenses for 72 staff years, a decrease of $1,020,000 and 22 staff years from the FY 1982 appropriation.

The next segment of my testimony concerns the Strategic Petroleum Reserve.

## FY 1983 SPR BUDGET

# SPR OIL ACQUISITION ACTIVITIES

We have made a great deal of progress over the past year in filling the Reserve. As of March 22, 1982 the Strategic Petroleum Reserve contained 244 million barrels of crude oil and has a maximum draw down capability of 1.7 million barrels per day.

The total fill for calendar year 1981 was 122.5 million barrels, resulting in a cumulative fill of 230.3 million barrels by the end of 1981, which doubled the Reserve inventory from the December 1980 level. We exceeded an average daily fill rate of 300 thousand barrels per day for seven months last year with the highest rate of 513 thousand barrels per day achieved in May.

We used several methods to acquire SPR oil during 1981:

- 81 million barrels were acquired under a continuous open solicitation, taking advantage of the favorable spot market conditions which prevailed during this period.
- 20 million barrels were acquired under a commercial contract with Petroleos Mexicanos (PEMEX) in 1981.
- 20.7 million barrels were delivered under the Naval Petroleum Reserves (NPR) exchange agreements entered into in 1980 and from an NPR contract settlement.
- .8 million barrels of Alaskan North Slope crude oil were delivered to the SPR as part of a final settlement of a Consent Order.

There were four reasons for the SPR's oil acquisition success over the past year: (1) the policy impetus and sustained support of top Administration officials; (2) availability of oil storage capacily which had been left unfilled when this Administration took office; (3) favorable oil market conditions; and (4) Congressional approval of nearly $5 billion in appropriations requested by President Reagan since he took office.

For the remainder of FY 1982, we have an additional 23 million barrels under contract and scheduled for delivery. This will increase our cumulative SPR inventory to 267 million barrels at the end of FY 1982.

Since we now have contracted for most of the oil to be delivered to SPR facilities for the remainder of this fiscal year, we have temporarily deferred accepting further offers under the continuous open solicitation. Later this year we will again accept offers for short-term delivery as new storage capacity becomes available. We also plan to solicit contracts later this year for deliveries of oil to fill Phase II storage capacity during fiscal year 1983.

## FACILITIES DEVELOPMENT AND OPERATION

We are developing the SPR program in three separate phases to provide 750 million barrels of capacity.

Phase I consists of 250 million barrels of storage capacity at five sites - Bryan Mound in Texas; and Bayou Choctaw, West Hackberry, Weeks Island and Sulphur Mines in Louisiana. It also includes construction of a government-owned terminal facility at St. James, Louisiana. Construction was completed on these sites in 1980, and we expect to complete actual oil fill of Phase I storage in FY 1982.

Under Phase II, we will gain an additional 290 million barrels of storage by expanding three existing Phase I sites. Bryan Mound is being expanded by 120 million barrels, West Hackberry by 160 million barrels and Bayou Choctaw by 10 million barrels. An existing storage cavern will be acquired for the additional capacity at Bayou Choctaw. New caverns will be created at Bryan Mound and West Hackberry through solution mining. Construction of all Phase II surface facilities was completed in 1981.

We started leaching of Phase II caverns at Bryan Mound in 1980 and at West Hackberry in May 1981. To date approximately 50 million barrels of gross cavern volume have been created in the Phase II caverns and we have begun injecting oil into the seven caverns which are available for oil fill at Bryan Mound. Acceleration of cavern development is being achieved through an increase of the leaching rate, which required modification of the brine disposal permit. This permit was granted last August by the Environmental Protection Agency. The increased leaching rate will provide 47 million barrels of additional storage capacity by the end of 1985 over the projections in the FY 1982 budget.

Phase III involves the further expansion of Bryan Mound and West Hackberry by an additional 70 million barrels and development of a new 140 million barrel site at Big Hill, Texas. The Big Hill site, as currently planned, will include fourteen new caverns and the necessary surface facilities, and when filled will increase the SPR drawdown rate to almost 4.5 million barrels per day. The Final Supplemental Environmental Impact Statement for SPR Phase III Development was published in October 1981, with the Record of Decision issued in January 1982. Detailed design was started in 1981, and Phase III construction will begin at Bryan Mound in 1982.

We have submitted a deferral to FY 1983 of FY 1982 budget authority for Big Hill land acquisition and long lead equipment. As the result of an Administration decision to delay completion of the 750 million barrel system by one year, to 1990, start of Big Hill construction is to be delayed one year, until 1984. This delay will have no effect on available storage capacity until 1987. Detailed design, however, will continue in FY 1982.

## FY 1983 BUDGET REQUEST

The President's FY 1983 budget proposes a total of $2,316,178,000 in appropriations for the Strategic Petroleum Reserve. Of this total, $242,118,000 is for the on-budget Strategic Petroleum Reserve account to be used for storage facilities development and operations, planning, and program direction, and $2,074,060,000 is for the off-budget SPR Petroleum Account. A further element of the President's FY 1983 budget is the deferral of $52,860,000 in FY 1982 appropriations for certain Phase III development activities.

During FY 1983 we will continue to fill the Strategic Petroleum Reserve to the full level of storage capacity as it becomes available. We expect to fill the SPR at an average daily fill rate of about 209 thousand barrels per day which would increase the cumulative fill level to 343.1 million barrels by the end of FY 1983.

## OFF-BUDGET APPROPRIATION FOR PETROLEUM ACQUISITION AND TRANSPORTATION

The President's FY 1983 budget proposes an appropriation of $2,074,060,000 to the off-budget "SPR Petroleum Account" established pursuant to the Omnibus Budget Reconciliation Act of 1981. We plan to by 53 million barrels from the proposed FY 1983 appropriation, about 7 million barrels of which will be delivered in FY 1983, with the remaining 46 million barrels planned for delivery in FY 1984.

Since our existing appropriations through FY 1982 will permit contracting for a cumulative 336 million barrels, we are nearly in a position to fill the SPR storage capacity through the end of FY 1983 using only FY 1982 and prior year funding.

The substantial purchasing power of our FY 1982 and prior year funds explain why the further appropriations proposed for FY 1983 are significantly below the FY 1982 budget authority level. Actual outlays are expected to be approximately the same in FY 1982 and FY 1983--above $2.8 billion in each year. As provided by the Omnibus Budget Reconciliation Act of 1981, these outlays are not counted within Federal budget totals.

## FACILITIES DEVELOPMENT

The FY 1983 budget request for facilities development and operations is $222,528,000. The proposed FY 1983 budget will permit continuation of Phase II capacity development, completion of Bryan Mound Phase III construction, and continued development of West Hackberry. With respect to facilities development, the proposed FY 1983 budget updates the baseline schedule for leaching new storage capacity primarily due to the decision to increase the leaching rate at the Bryan Mound site. As a result, we are now projecting a cumulative oil storage capacity of 456 million barrels by the end of FY 1985, an increase of 47 million barrels from the 409 million barrel projection for FY 1985 associated with the FY 1982 budget baseline. The deferral of funding for long-lead equipment purchases and real estate acquisition for the Big Hill

Phase III site from FY 1982 to FY 1983 is the result of a decision to delay completion of the 750 million barrel system from FY 1989 to FY 1990. In the context of the Administration's policy of fiscal restraint, the reconfiguration of the SPR facilities development schedule represents the Administration's decision to focus SPR resources on the near-term (e.g. pre-1985) period when we are relatively more vulnerable. The one-year delay in initiation of Big Hill construction will reduce outlays by $175,000,000 in FY 1983 and FY 1984 while having no effect on storage capacity until 1987. At that point, the SPR will be more than two-thirds filled and the nation considerably less vulnerable to supply disruptions.

## NON-PHASE SPECIFIC

This funding category was established several years ago to finance SPR facilities requirements not directly associated with specific phases of SPR development. For FY 1983, we propose a total of $86,728,000 for Non-Phase Specific activities, including Continuing Engineering ($8,648,000), Operations and Maintenance ($37,345,000) and Safety, Reliability, and Security Upgrades ($40,735,000).

Continuing Engineering activities in FY 1983 will remain at approximately the FY 1982 level and are required to identify and resolve technical problems, maintain an accurate definition of the SPR system and promote an integrated systems approach to SPR development activities.

Operations and Maintenance activities will be required for the duration of the SPR program but are particularly intensive during the period of facilities development and fill. Some operations and maintenance activities are funded within specific Phases, particularly those directly associated with storage cavern development. Others are funded through this Non-Phase Specific activity. The increase in budget authority proposed for FY 1983 reflects a combination of our ongoing reestimation and definition of operations and maintenance requirements plus the particular manner in which funding for these requirements is distributed among budget line items.

The Safety, Reliability and Security Upgrades program is an ongoing effort to modify existing SPR facilities from the original design criteria to new and more stringent criteria which emphasize safety, reliability, and security and provide more assurance of readiness of the SPR system for drawdown. A backlog of these projects has developed and the increase in funding in FY 1983 is intended to reduce this backlog and enhance system performance capabilities.

The final portion of my testimony covers the Naval Petroleum and Shale Oil Reserves.

## NPOSR BACKGROUND

The Naval Petroleum and Oil Shale Reserves (NPOSR) consist of three petroleum reserves -- two in California and one in Wyoming -- and three oil shale reserves -- two in Colorado and one in Utah. They were established by a series of Executive Orders between 1912 and 1924 to provide a source for emergency petroleum supplies for the Navy.

Naval Petroleum Reserve No. 1 (NPR-1) consists of 47,985 acres located 35 miles southwest of Bakersfield, in Kern County, California. It was established in 1912 after the Secretary of the Navy asked for the cooperation of the Secretary of the Interior in securing the reservation for the Navy of oil-bearing public lands in California sufficient to insure a supply of 500 million barrels of oil. In response to this request, the U.S. Geological Survey recommended an area, Elk Hills in Kern County. Subsequent exploration has proven the wisdom of that choice, as recoverable reserves exceeded 1 billion barrels.

Naval Petroleum Reserve No. 2 (NPR-2) consists of 30,181 acres adjacent to and south of NPR-1. It was also established by Executive Order in 1912, and has been leased continuously since the early 1920's, producing over 600 million barrels of crude oil and leaving now only about 3% of recoverable reserves in place. Naval Petroleum Reserve No. 3 (NPR-3) consists of 9,481 acres located 35 miles north of Casper, Wyoming, in Natrona County. This Reserve was established by Executive Order in 1915. It was developed and produced until December 31, 1927, when the Reserve was shut-in following action by the Government to cancel the leases. The field remained in a shut-in status until the 1976 Production Act, except for a short exploratory program during 1951-1953, and an off-set drilling and production program initiated in 1958 to prevent drainage from the Reserve.

In 1976, the Naval Petroleum Reserves Production Act was passed which mandated that the Reserves be produced at their maximum efficient rates for six years, ending April 5, 1982. This Act also included provisions for extending production beyond that date in three year increments. It was intended that revenues from the sale of the petroleum would help offset the costs of exploring and developing the Reserves and the costs related to the Strategic Petroleum Reserve which was authorized in 1975. The 1976 Act did not change the national defense character and mission of the Naval Petroleum Reserves.

The Naval Oil Shale Reserves were originally set-aside as a further guarantee of oil for the Navy in future emergencies. Until 1977, the only activity at the Naval Oil Shale Reserves had been research conducted at a facility on Naval Oil Shale Reserve No. 3. In 1977, a Five-Year Predevelopment Program was initiated to analyze the resource, technical, environmental and socioeconomic factors related to future development of the Oil Shale Reserves. In regard to oil shale, this work largely has been completed. Assessment of the conventional oil and gas potential of these Reserves is continuing.

## FY 1981 AND FY 1982 PROGRAM HIGHLIGHTS AND ACCOMPLISHMENTS

The Naval Petroleum and Oil Shale Reserves continued in 1981 to demonstrate their flexibility as vital national defense resources by providing petroleum both to the Department of Defense and to the Strategic Petroleum Reserve. The Reserves also contributed to the local petroleum industry by providing high quality crude oil, natural gas and liquid products for sale. Sale and exchanges for the Government's share of petroleum produced at the Reserves generated revenues of $1.6 billion for the U.S. Treasury, with program expenditures of approximately $216 million.

A major decision was reached in 1981 to continue production of the Naval Petroleum Reserves at their maximum efficient rates for three years beyond the initial six-year period ending April 4, 1982. Although the decision by the President was based primarily on economic considerations, the Department of Defense will benefit by receiving all of the Government share of crude oil production from the Reserves beginning May 1, 1982. DOD will exchange the crude for military fuels delivered at various locations in the United States. The exchange is open to all companies regardless of size thereby assuring competition. This assured supply of oil will help insulate the Department of Defense from the adverse impacts of future crude oil shortages.

Oil produced at Naval Petroleum Reserve No. 1 was also used indirectly to help resume fill of the Strategic Petroleum Reserve. The exchange program through which NPR-1 oil was exchanged for oil delivered to SPR storage sites was concluded November 1, 1981. Over the year preceding that date, an average of 103,472 BOPD were sold to six companies who provided an equivalent amount, totaling 36.7 million barrels, for storage in the Strategic Petroleum Reserve.

The past year was also notable in that the largest Reserve, NPR-1, reached its peak production rate. Production averaged 171,533 BOPD for the year, peaking at 181,800 BOPD in July 1981. The production rate had declined to about 172,000 BOPD by the end of calendar year 1981, and the rate will continue to decline as the Reserve is produced at the maximum efficient rate. Production of oil at NPR-3 remained stable, averaging 3,393 BOPD in 1981.

Attached to this statement is a statistical summary which includes exploration, development, production and revenue data for fiscal years 1981, 1982 and 1983.

## FY 1983 BUDGET REQUEST

The FY 1983 Budget Request of $232,500,000 supports the President's decision to continue production of the Naval Petroleum Reserves at their maximum efficient rates and the Secretary's decision to forego further activity at the Naval Oil Shale Reserves at this time.

The budget request for the Naval Petroleum Reserves in California (NPR-1 and NPR-2) is $207,417,000. The funding is requested in four categories: (1) Operations and Maintenance ($102,267,000); (2) Exploratory Drilling ($10,000,000); (3) Development Drilling ($89,813,000); and (4) Development Facilities ($5,337,000).

The bulk of the Operations and Maintenance funds will be used to continue normal oil-field operations. For example, $38,025,000 will be used for the normal maintenance and repair of pipelines, tank settings and other field equipment; maintenance of the roads; operation of the water injection systems; maintenance of the electrical distribution system; and related activities. Another $17,198,000 will be used to fund various remedial actions needed to maintain wells in an optimum producible condition. Such actions include recompletions, well stimulation measures, artifical lift installations, and others. At an average cost of about $60,000 per well, the budget would permit work on an estimated 282 wells.

Also, in the Operations and Maintenance category, some $20,462,000 will be needed for the operations and maintenance of the gas plants and the liquid products loading racks. This covers all the facilities which are processing about 300 MMCF/D of natural gas and 600 thousand gallons per day of liquid products.

The request of $89,813,000 for Development Drilling is based on an optimum drilling program including water and gas injection as well as producing wells. To maintain maximum efficient production, an estimated 80 to 90 wells will be required annually for some period; this request provides for 85 wells.

The Development Facilities request is for $5,337,000. This category is reduced from prior years because the major constuction project at NPR-1, the California Development Project consisting of 25 separate construction projects, has been fully funded for $361,200,000. Because it has been determined that one of the projects, the rail-loading facility, will not be needed, with the Committee's concurrence, $5,000,000 of those funds will be applied to FY 1983 facility projects. The total facility construction program for FY 1983, therefore, will consist of $10,335,000 for a variety of field projects.

The Exploration Drilling request is for $10,000,000. This will fund three wells to be drilled in areas with geological characteristics similar to current producing areas.

The FY 1983 Budget Request for Naval Petroleum Reserve No. 3 (NPR-3) is $19,855,000. Almost two-thirds of this request, $12,605,000, is to support routine Operations and Maintenance activities. The other requests include $5,750,000 for the Development Program, most of which is for drilling in-fill wells, and $1,500,000 for the operation and evaluation of the Enhanced Oil Recovery Pilot projects. If the pilot program is successful, full-scale operations would be inititated in FY 1984.

The Naval Oil Shale Reserves request has been reduced in FY 1983 to $90,000. This reflects completion of the Five-Year Predevelopment Program for these Reserves to assess the resource and the preparation of a Programmatic Environmental Impact Statement. The program has been very successful in providing information which will greatly expedite a development program at the appropriate time. The FY 1983 request will support a limited monitoring of the environment, including hydrology, and will fund the land management program conducted by the Bureau of Land Management.

The final category is Program Direction, which is used primarily to pay salaries, benefits, travel and training for the 120 Civil Service employees who manage this program. The FY 1983 Budget Request for this category is $5,138,000.

Mr. Chairman, this concludes my prepared statement. I would be pleased to answer any questions.

Attachment

## SELECTED STATISTICAL DATA

| | FY 1981 Actual | FY 1982 Estimated | FY 1983 Estimated |
|---|---|---|---|
| **NPR-1** | | | |
| **Production** | | | |
| Oil (MBOPD) | 171.5 | 172.0 | 157.0 |
| Liquid Products (MGAL/D) | 508.3 | 617.0 | 700.0 |
| Gas (MMCF/D) | 276.8 | 304.0 | 350.0 |
| **Revenue ($ Million)** | | | |
| Oil* | $1,430.5 | $1,536.2 | $1,455.7 |
| Liquid Products | 82.0 | 92.6 | 116.3 |
| Gas | 61.5 | . 71.6 | 78.9 |
| TOTAL | $1,574.0 | $1,700.4 | $1,650.9 |
| **Wells** | | | |
| Drilled (Annual) | 49 | 95 | 88 |
| Cumulative (All Sources) | 2,055 | 2,150 | 2,238 |
| Producible | 1,160 | 1,262 | 1,299 |
| Average Wells on Production | 1,081 | 1,161 | 1,195 |
| **NPR-3** | | | |
| **Production** | | | |
| Oil (MBOPD) | 3.4 | 3.6 | 3.0 |
| Liquid Products (MGAL/D) | 16.1 | 16.0 | 18.0 |
| Gas (MMCF/D) | 7.7 | 8.0 | 8.0 |
| **Revenue ($ Million)** | | | |
| Oil* | $44.9 | $46.9 | $39.7 |
| Liquid Products | 2.3 | 2.9 | 3.2 |
| Gas | .1 | 2.3 | 2.5 |
| TOTAL | $47.3 | $52.1 | $45.4 |
| **Wells** | | | |
| Drilled (Annual) | 22 | 23 | 21 |
| Cumulative (All Sources) | 679 | 702 | 723 |
| Producible | 454 | 460 | 470 |
| Average Wells on Production | 439 | 450 | 460 |

* Includes Windfall Profit Tax

## SUMMARY STATEMENT

Mr. **Yates**. Secretary Vaughan, tell us about the Strategic Petroleum Reserve. Are you buying or selling or doing neither? Are you storing?

Mr. **Vaughan**. Yes, sir.

Mr. **Yates**. Okay, tell us about what you are doing.

Mr. **Vaughan**. What I would like to do, Mr. Chairman, is briefly summarize the key points of my statement.

Mr. **Yates**. You may do that.

Mr. **Vaughan**. Then go to your questions. I think it will answer some of your questions in advance.

Mr. **Yates**. Fine.

Mr. **Vaughan**. You have introduced the people that are with me. Let me discuss the basic approach to emergency preparedness, if I may for just a few moments, and then fold the relationship of the other programs in.

The overriding goals of the Department's energy emergency preparedness program are to reduce the Nation's vulnerability to energy supply disruptions and to mitigate their impacts on the Nation.

We have, as you know, abandoned the policy of extensive Federal intervention, such as oil allocation, price controls———

Mr. **Yates**. Such as what?

Mr. **Vaughan**. Oil allocations, price controls and mandatory demand-restraint measures because we found that these measures created or exacerbated adverse economic and social conditions.

Our strategy to achieve these goals is to rely primarily on the marketplace to respond to disruptions in energy supplies and to fill the Strategic Petroleum Reserve.

Accordingly, we seek to remove barriers to short-term adjustments in the marketplace. In addition to our commitment to the Strategic Petroleum Reserve, we want to encourage the build-up of private stocks by suppliers and large consumers before an emergency, and we are working to remove disincentives to private stockbuilding.

We also encourage suppliers, consumers, and State and local governments, to develop their own contingency approaches.

## EMERGENCY PREPAREDNESS BUDGET REQUEST

To go very specifically and in a summary manner to the Emergency Preparedness fiscal year 1983 budget request, the budget request for the Office of Energy Emergencies for 1983 is $5.4 million, a decrease of $4.8 million from the fiscal year 1982 appropriation.

During fiscal year 1983, our emphasis will be to enhance fiscal year 1982 planning and operational readiness initiatives so we can assess national security needs and identify necessary responses during an energy emergency.

To carry out these objectives, the program will maintain and improve upon in-house expertise for planning and operations, thereby reducing the need for outside contract support.

This request will permit us to address practical energy emergency programs, develop new responses, and analyze policy issues concerning energy supply emergencies.

Another emphasis is our support for voluntary U.S. company participation in the international agency oil-sharing program during emergencies.

We will also be involved with NATO-related planning for oil supply and distribution, and will develop scenarios to profile potential emergencies and develop and test appropriate responses.

This budget request will also allow us to implement defense programs and prepare to coordinate communications and operations during energy emergencies.

We will focus on programs to provide accurate and timely information to State and local governments and to the general public.

### STRATEGIC PETROLEUM RESERVE BUDGET REQUEST

To turn to the Strategic Petroleum Reserve fiscal year 1983 budget request, Mr. Chairman, the Strategic Petroleum Reserve presently contains 252 million barrels of crude oil and has a maximum draw-down capability of 1.7 million barrels per day.

During the first week of April, we placed the 250 millionth barrel of oil in storage. In the past 14 months, this Administration, with the assistance of the Congress, has increased the oil stored in the reserve by over 130 percent to where it is now one-third full.

For the remainder of fiscal year 1982, we have an additional 16 million barrels under contract and scheduled for delivery. This will increase our cumulative strategic petroleum reserve inventory to 267 million barrels at the end of fiscal year 1982.

The President's fiscal year 1983 budget proposes a total of $2.3 billion in appropriations for the Strategic Petroleum Reserve. Of this total, $242 million is for the on-budget Strategic Petroleum Reserve account, to be used for storage facilities development and operations, planning and program direction.

In addition, $2 billion is for the off-budget strategic petroleum reserve oil acquisition account.

During fiscal year 1983, we will continue to fill the Strategic Petroleum Reserve to the full level of permanent storage capacity as it becomes available.

Mr. YATES. What is that? What is full capacity?

Mr. VAUGHAN. It will be—

Mr. FURIGA. At the end of fiscal year 1983, 343 million barrels.

Mr. YATES. Go ahead, Mr. Secretary.

Mr. VAUGHAN. We expect to fill the Strategic Petroleum Reserve at an average daily fill rate of about 209,000 barrels per day, which would increase the cumulative fill to 343.1 million barrels by the end of fiscal year 1983.

We are developing the Strategic Petroleum Reserve program in three separate phases to provide the 750 million barrels of capacity necessary for the total program.

Phase I consists of 250 million barrels of storage capacity at five sites, which will be filled during this fiscal year. As a matter of fact, it is, for all intents and purposes, filled as of the first of April.

Mr. YATES. Are these the Louisiana sites?

Mr. VAUGHAN. And Texas. We will gain 290 million barrels of storage by expanding three of the existing phase-I sites. To date, approximately 50 million barrels of gross volume have been created in phase II and we have begun injecting oil into seven caverns.

Acceleration of cavern development will provide 47 million barrels of additional storage capacity by the end of 1985 over the projections we had in our fiscal year 1982 budget.

Phase III involves further expansion by an additional 210 million barrels, including a new 140 million-barrel site at Big Hill, Texas.

As a result of an Administration decision to delay completion of the 750 million total system for 1 year from 1989 to 1990, we have submitted a $53 million deferral of fiscal year 1982 budget authority for Big Hill land acquisition and long-lead equipment.

Mr. YATES. Would you repeat that statement? I am not sure I followed it. The Administration has made a decision—

Mr. VAUGHAN. We deferred the completion of the final program, Mr. Chairman from——

Mr. YATES. Fiscal year 1989?

Mr. VAUGHAN. During calendar 1989, from being completed in 1989 to 1990. We have slipped the total completion of the project by 1 year.

Mr. YATES. Okay.

Mr. VAUGHAN. That is the effect, of course, of the $53 million deferral.

Mr. YATES. All right.

Mr. VAUGHAN. That involves land acquisition and long-lead equipment acquisition.

Mr. YATES. How much will that leave you for the purchasing if you defer $53 million? How much will be available in fiscal year 1983?

Mr. FURIGA. The facilities?

Mr. YATES. Yes.

Mr. VAUGHAN. $222 million is the amount requested for storage facilities development and operations.

Mr. YATES. All right.

Mr. VAUGHAN. The start of Big Hill construction, then, will be delayed 1 year until 1984.

Mr. YATES. What is the nature of the construction at Big Hill—surface tanks or salt domes?

Mr. VAUGHAN. No, below ground, salt domes.

Mr. FURIGA. It is a completely new site, grassroots site, nothing has been done.

Mr. VAUGHAN. The delay will not affect our capacity until 1987, in any event, because it was the last part of the program. It is the final project in the program.

## NAVAL PETROLEUM AND OIL SHALE RESERVES BUDGET REQUEST

Let me turn to the Naval Petroleum and Oil Shale Reserves budget for 1983.

The fiscal year 1983 budget request for the NPR totals $232 million. This request is consistent with the President's decision to continue production of the naval petroleum reserves at their maximum efficient rates.

Production at the reserves will continue at least through April of 1985. We will forego further development of the naval oil shale reserves in Colorado and Utah after completion, this year, of the 5-year predevelopment plan.

This will leave the reserves in a state of readiness for future development.

The Naval Petroleum and Oil Shale Reserves were originally established to guarantee a source of petroleum supplies for the Navy. They continue to demonstrate their importance as a vital national defense resource, and as a significant resource of revenues for the Government.

Production of the largest reserve, NPR-1 at Elk Hills, California, peaked at 181,800 barrels of oil per day in July 1981, with production for the fiscal year averaging 171,533 barrels of oil per day.

Production of oil at NPR-3 in Wyoming averaged 3,393 barrels per day in fiscal year 1981. Sales and exchanges for the Government's share of petroleum produced at the Naval Petroleum Reserves in fiscal year 1981 generated revenues of $1.6 billion with program expenditures of approximately $216 million.

### NPR/SPR OIL EXCHANGE

From November 1, 1980, through November 1, 1981, an exchange program was undertaken whereby oil produced at NPR-1 was exchanged for oil delivered to the Strategic Petroleum Reserve's storage sites.

Under this program, a total of 36.7 million barrels went into the Strategic Petroleum Reserve.

Sales of NPR oil to the Department of Defense started in July of 1981.

Mr. **Yates**. What was the policy behind that, if I may interrupt you, Mr. Secretary? Why the exchange from Elk Hills, rather than going out in the market and buying it?

Mr. **Vaughan**. Let me ask Mr. Furiga, who was on board at the time that decision was made. He can give you a more precise answer than I can.

Mr. **Furiga**. At the time of the exchange, Mr. Chairman, the options were to go out on the market, as we normally had in the past and as we are doing now, or to do an exchange.

That decision, to do an exchange rather than enter the market again, was made at the very highest level in the Administration at that time.

Mr. **Yates**. What was the reasoning?

Mr. **Furiga**. I don't know firsthand, but I am told that they did not want the Strategic Petroleum Reserve to make an overt move into the market. while the exchange, people may argue, did the same thing because we took oil off the market in exchange for the NPR crude.

The Strategic Petroleum Reserve was not itself in the market. That is the reason—just for appearances.

Mr. **Yates**. I would have thought that our own domestic reserves would be in the nature of a strategic petroleum reserve themselves. Why use their oil to fill up the Strategic Petroleum Reserve? I would have thought it would have been better to take oil from other places to fill up the reserve.

Mr. Furiga, this isn't your reason, your's not to reason why, right? You just take orders. Who gave you the order?

Mr. **Furiga**. I am told the decision, as I said, was made——

Mr. **Yates**. How did you get the order? Was there an Executive order that came down to you or what? How did you know about it?

Mr. **Furiga**. The President made the decision to use the NPR oil and that decision was communicated to the Department of Energy.

Mr. **Yates**. How did you get it? What is the mechanics of it?

Mr. **Furiga**. He signed an Executive order.

Mr. **Yates**. Do you have a copy of that Executive order?

Mr. **Furiga**. I don't have it with me.

Mr. **Yates**. Do you have a copy in your files? Would you please make it available for the committee.

Mr. **Furiga**. Yes.

[The information follows:]

### EXECUTIVE ORDER 12231

Executive Order 12231, dated August 4, 1980, follows. This Executive Order authorized the Secretary of Energy to undertake the exchange of naval petroleum reserves oil for oil delivered to the strategic petroleum reserve.

### PRESIDENTIAL DOCUMENTS—EXECUTIVE ORDER 12231 OF AUGUST 4, 1980

#### STRATEGIC PETROLEUM RESERVE

By the authority vested in me as President of the United States of America by Title VIII of the Energy Security Act (Public Law 96-294) and by Section 301 of Title 3 of the United States Code, and in order to meet the goals and requirements for the strategic petroleum reserve, it is hereby ordered as follows:

1-101. The functions vested in the President by Section 160(c) of the Energy Policy and Conservation Act, as amended, are delegated to the Secretary of Energy (42 U.S.C. 6240(c); see Section 801 of the Energy Security Act).

1-102. The functions vested in the President by Section 7430(k) of Title 10 of the United States Code are delegated to the Secretary of Energy (see Section 804(b) of the Energy Security Act).

1-103. The functions vested in the President by Section 805(a) of the Energy Security Act are, consistent with Section 2 of Executive Order No. 11790, as amended, delegated to the Secretary of Energy.

JIMMY CARTER.

THE WHITE HOUSE,
*August 4, 1980.*

Mr. **Vaughan**. I would point out, Mr. Chairman, this was made by the previous Administration, of course.

Mr. **Yates**. That may or may not make it right. I wouldn't have thought that we would want to build a strategic petroleum reserve from our domestic reserves. I would have thought that domestic reserves would already be considered a strategic reserve comparable to the new SPR.

I don't know why we would exchange unless, of course—what happens to the money? Is this just a bookkeeping transaction as far as the books are concerned?

Mr. **Furiga**. The strategic petroleum reserve funds are used to pay for the crude, and they eventually went to the NPR account.

Mr. **Yates**. Was the money actually paid, or was it just a bookkeeping transaction?

Captain **Gilmore**. No, there was money actually paid over, Mr. Chairman. We sold the oil to the Strategic Petroleum Reserve. They paid the revenue to us and deposited the money in the Treasury.

Mr. **Yates**. I don't understand the advantage of that. Captain, could you tell us what would be the reasoning? Why would the President sign an executive order on that? What's the advantage of it?

Captain **Gilmore**. Well, Mr. Chairman, I don't know——

Mr. **Yates**. Well, speculate for us. Why would he do that? Why wouldn't it be better just to——

Mr. **Vaughan**. May I help with this, Mr. Chairman?

Mr. **Yates**. Sure.

Mr. **Vaughan**. I explored some of this, asking people in the program, but it was not very helpful because this is not a decision that emanated from the program up. It came from the top down.

Mr. **Yates**. Are you high enough to tap the top to find out?

Mr. **Vaughan**. Well, I am not sure that we would really be able to reconstruct that at this stage of the game since it was not made by this Administration.

Mr. **Yates**. What is the date of the Executive order?

Mr. **Furiga**. August of 1980.

Mr. **Yates**. 1980.

Mr. **Vaughan**. It was authorized under the Energy Security Act, so I do not mean to imply in any way an impropriety. It was fully in accord with law, fully permitted.

Mr. **Yates**. Okay.

Mr. **Vaughan**. But the rationale is not existent in the program, Mr. Chairman.

Mr. **Yates**. Maybe we can find out from some other source, then. All right, thank you, Mr. Secretary.

### SALE OF NPR OIL TO DEFENSE

Mr. **Vaughan**. The sales of Naval Petroleum Reserve oil to the Department of Defense started in July of 1981. Beginning on May 1, 1982, all of the Government's share of crude oil from the NPR will be sold to the Department of Defense, thereby assuring a steady source of military fuels for our armed forces.

Mr. Chairman, this concludes my summary of the statement.

Mr. **Yates**. Thank you very much for a very good statement.

### NPR PRODUCTION

You are moving forward with a very aggressive program of production from Elk Hills and I take it from the Wyoming reserves, too.

Do we have to worry about depleting the reserves and running out in the near future?

Mr. **Vaughan**. Let me try to initially respond and Captain Gilmore, you could add remarks if you wish.

Mr. Chairman, we have peaked at the maximum production rate at Elk Hills in 1981. Some years ago, the maximum was reached in the Wyoming reserves which are much smaller.

We are much like an oil field, we are on the decline curve. That decline at a maximum efficient rate of production will have at least approximately 10 years in the main reserve, slightly less than that, if I recall the numbers correctly, in the reserve in Wyoming.

Having put in place the production potential in the form of some 900 wells at Elk Hills and a lesser number out in Wyoming, as well as gas plants to extract the liquids and handle the natural gas that is co-produced, there is a tremendous investment in equipment and capability that would be put idle.

It makes economic sense to develop the reserve, and down the road or concurrently, look into questions such as enhanced oil recovery or sources elsewhere. It is a perfectly normal and, in my judgment, economically sound way to produce those reserves with the capability in place.

It would be a tremendous expense to mothball that kind of productive capability.

Mr. **Yates**. But if we increase it, do we have to worry about running out of the reserves?

Mr. **Vaughan**. Eventually, in all candor, yes, sir, you will produce the reserves in an oilman's projection, of about 10 years. Then you go to enhanced recovery, which in Elk Hills has been quite successful in the neighboring fields; or you can explore deeper zones.

Mr. **Yates**. I wonder whether it makes more sense with oil prices being what they are to import more and save the oil we have in our reserves for some future time.

Mr. **Vaughan**. May I just indicate, Mr. Chairman, just this fall, in anticipation of the 6-year development and production phase ending in April of this year, the Department, on behalf of the President, prepared a recommendation to the President under the Naval Oil and Shale Production Act of 1976, to continue production at the maximum rate for the next 3 years.

The President made that decision. That decision was a subject of hearings before both Houses of the Congress, both Energy and Armed Services Committees, as appropriate; and the Congress, both Houses, had an opportunity to nonconcur.

That 3-year review goes on forever, so that is why, in my statement, I said this production will continue until 1983.

At that time, another proposal would be made and it could go either way.

Captain **Gilmore**. Mr. Chairman, may I give you some fairly specific information. If production is continued on until 1990, uninterrupted, then we are projecting the Naval Petroleum Reserves will be producing 75,000 to 77,000 barrels per day at that time, compared with the 181,000 peak in July of last year.

Mr. **Yates**. Why the projection for a lesser rate at that time?

Captain **Gilmore**. That will be the peak production at that period of time with normal production decline between now and 1990.

Mr. **Yates**. Because of the loss of oil reserves?

Captain **Gilmore**. Just using up the oil reserves over time.

Mr. **Yates**. Does that make sense?

Captain **Gilmore**. Yes, sir. In all oil fields, you have a normal production decline, you have a development phase, you peak and you start a long decline for the rest of the life of the oil field.

So it is a normal evolution, fairly predictable.

Mr. **Yates**. Perhaps I don't know the oil business very well, but why not produce at 77,000 barrels now, which isn't your maximum daily rate, wouldn't that leave oil in reserve for many more years to come?

Captain GILMORE. It would stretch out the life of the reserve considerably if we produced at a rate below the maximum efficient rate.

Mr. YATES. If that is true, oil prices being as low as they are now, why doesn't it make sense to buy the oil now rather than producing 180,000 barrels per day from the Naval Petroleum Reserves?

Captain GILMORE. Secretary Vaughan can probably explain the Administration's position.

Mr. YATES. That is a policy matter, and I would like the Secretary to respond.

Mr. VAUGHAN. The fundamental reason, Congressman, for making that decision was that over the next 3 years, that production will generate revenues to the general Treasury of $4.5 billion, and we are in very tight budget times and that was certainly a very important factor.

Mr. YATES. All right.

Mr. VAUGHAN. I might add, Mr. Chairman, that the Department of Defense and the Joint Chiefs of Staff were involved in this and consulted in that decisionmaking. They were well aware of it and we discussed this at some length. The report brought to the President's attention discussed this, that he was weighing a military reserve and a budget consideration. But I think, and since I made part of the argument, after all, military affairs these days are primarily matters of money, and that this looked like a reasonable trade.

As I indicated, the law does require that the President himself make the decision every 3 years, and as a protection, you gentlemen built into the statute, that you have a right in either House to nonconcur.

So I would expect that cycle to roll through again in 1985.

### RATE OF SPR FILL

Mr. YATES. Well, the Budget Reconciliation Act instructed the Administration to fill at a daily rate of 300,000 barrels a day.

How far from that instruction are you?

Mr. VAUGHAN. In fiscal year 1983, we will be at 209,000 barrels a day. This year, it is slightly lower than that, 185,000.

Mr. YATES. Well, the act instructed you to fill at 300,000 barrels a day. Can you not achieve that goal? What is the reason for not filling at 300,000 barrels per day?

### USE OF TEMPORARY STORAGE

Mr. VAUGHAN. The reason, Mr. Chairman, is that this is the natural and necessary result of budget decisions of the preceding 3 years, to create capacity. We will be filling at capacity.

The only alternative is to acquire oil at a higher rate than we have in the budget for this year and next is to go into some sort of temporary or interim storage. We are currently investigating that subject area at the request of the Senate.

I might add your colleagues in the House Energy Committee, also, were part of that request.

Mr. **Yates**. What would a temporary storage program be like? What would you have to do?

Mr. **Vaughan**. Let me list some options.

We would have to lease and use unused private salt storage, what is available.

We would lease, as an alternative, private tankage, that is, steel tanks that are around the country. Or use a technique the Japanese have used, which is to put it in tankers and use so-called floating storage. Or probably a combination of those.

Mr. **Yates**. Are you aware of the availability of private salt domes?

Mr. **Vaughan**. I am informed and we have some information that there are some salt domes available.

Mr. **Yates**. To what capacity?

Mr. **Furiga**. 20 to 30 million barrels, Mr. Chairman. That is private storage.

Mr. **Yates**. Yes.

Mr. **Vaughan**. Which, by the way, may or may not answer a solicitation from the Government. But our guess would be, since they are not using it, that we would intend them to be competitive and respond favorably.

Mr. **Yates**. Have you investigated that possibility thoroughly enough to know whether they are available presently or whether there would have to be some work done on them to make them useful to the Government as storage facilities?

Mr. **Vaughan**. From the investigations that we have done to date, focusing on crude oil storage facilities, we believe that we could find sufficient crude oil storage and not have to retrofit.

We are not far enough along to answer you with complete assurance on that subject, however.

But it is my considered estimate that if we were funded and directed to head in that direction, we would be able to find available storage without retrofit.

Mr. **Yates**. How much money, over and above the budget level requested, would be required to reach the prescribed statutory rate of 300,000 barrels a day?

Mr. **Furiga**. If we were to do the 300,000 barrels a day, until the 500-million barrel level is reached, in general terms, it would require something on the order of $500 to $600 million in facilities, additionally; and it would require advancing approximately $3 billion of oil acquisition money into the 1983 time frame, for 1984 and 1985.

Mr. **Vaughan**. Mr. Chairman, the GAO just completed a study of the additional cost for interim storage with some estimates. They have not come to us for comment, but I would have no quarrel with their estimates. I believe they are fairly accurate.

In fact, we were the chief source of their estimates and that was done at the request of Senator McClure of the Senate Energy Committee.

Mr. **Yates**. What did GAO conclude?

Mr. **Furiga**. Essentially, the same numbers.

Mr. **Vaughan**. We would be glad to furnish you a copy of that report for the record.

[The information follows:]

# GAO REPORT

U.S. GENERAL ACCOUNTING OFFICE,
*Washington, D.C., March 12, 1982.*

B-203117
Subject: Leasing Storage Capacity for the Strategic Petroleum Reserve (EMD-82-62).

Hon. PHILLIP R. SHARP,
*Chairman, Subcommittee on Fossil and Synthetic Fuels, Committee on Energy and Commerce, House of Representatives.*

DEAR MR. CHAIRMAN: As agreed in testimony before your Subcommittee on March 2, 1982, we are providing supplemental information on accelerating the fill rate for the Strategic Petroleum Reserve (SPR) by leasing existing storage capacity on a temporary basis. Leasing is one option which would enable the Department of Energy (DOE) to satisfy section 1033 of the Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35, Aug. 13, 1981), which states that the President shall seek to fill the SPR at an average annual rate of at least 300,000 barrels per day until the reserve contains at least 750 million barrels of oil.

As we testified, under DOE's current expansion plans and the fiscal year 1983 budget proposal, the SPR fill rate will continue to be constrained by the rate at which underground storage capacity can be created. The administration plans to complete the 750-million-barrel SPR by the end of fiscal year 1990. The SPR is scheduled to be filled at an average rate of about 186,000 barrels per day in fiscal year 1982. The fill rate would vary during each succeeding year, reaching a high of 225,000 barrels per day in fiscal year 1986 and a low of 68,000 barrels per day in fiscal year 1988. Leasing existing storage capacity until permanent capacity is available would enable DOE to accelerate the fill rate and take advantage of relatively favorable oil prices which now exist.

Tables 1 and 2 (see att. I) show the oil storage requirements and the costs that would be associated with achieving the 300,000-barrels-per-day fill rate goal by leasing existing storage capacity. Table 1 assumes that the fill rate goal is maintained until 750 million barrels are in storage. Table 2 assumes that the fill rate goal is maintained only until the first 500 million barrels are in storage; thereafter, the reserve would be filled at the rate constrained by the SPR expansion plan.

The permanent storage capacity shown in tables 1 and 2 reflects the current SPR expansion schedule. The difference between the amount of permanent storage capacity available annually and the storage requirements to meet the 300,000-barrels-per-day goal is the amount of temporary storage capacity that would have to be leased.

Table 1 shows that DOE would have to lease temporary storage capacity over 8 years in order to maintain a 300,000-barrels-per-day fill rate until 750 million barrels of oil are in storage. DOE would need to lease storage space ranging from about 42 million barrels in fiscal year 1982 to a peak of about 209 million barrels in fiscal year 1986. By early fiscal year 1987, 750 million barrels of SPR oil would be stored in some combination of permanent and temporary storage. Thereafter, oil would move from temporary to permanent storage as capacity becomes available, and DOE would have to continue leasing storage for about 3 more years.

To maintain a 300,000-barrels-per-day fill rate until the first 500 million barrels of oil are stored, DOE would have to lease temporary storage capacity over 4 years. While DOE would still need to lease about 42 and 75 million barrels in fiscal years 1982 and 1983, respectively, the maximum temporary storage capacity needed for any fiscal year would occur in fiscal year 1984 and require 83 million barrels.

Tables 1 and 2 also show the cost of leasing temporary storage capacity, in constant 1982 dollars, using two price assumptions each for above ground storage tanks and oil tankers. We did not independently estimate prices for leasing above ground steel tanks or oil tankers, but calculated the costs for storage based on price ranges provided by DOE and industry groups. For a 300,000-barrels-per-day fill rate for the 754-million-barrel reserve, the total cost for leasing the storage capacity would range from $1.8 billion to $2.0 billion for above ground steel tanks and from $2.9 billion to $3.6 billion for oil tankers.

For a 300,000-barrels-per-day fill rate for the first 500 million barrels only, leasing costs would be about one-fourth the cost of leasing to maintain the 300,000-barrels-per-day rate until the 750-million-barrel reserve is completed. For above ground steel tanks the cost ranges from $471 million to $523 million, and for oil tankers the cost ranges $785 million to $954 million.

We hope this information will be of assistance to the Subcommittee and to the Congress in their deliberations on the appropriate SPR fill rate. In order to meet the requested reporting time frames, we did not obtain official agency comments. As arranged with your office, we plan to distribute the report at this time to other interested parties.

Sincerely yours,

J. DEXTER PEACH, *Director.*

Attachment.

## ATTACHMENT

Table 1.—Leasing Costs to Achieve the 300,000-Barrels-Per-Day Fill Rate Goal Until 750,000,000 Barrels Are in the SPR

| | Fiscal year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Total |
| Oil storage requirements (millions of barrels): | | | | | | | | | | | |
| Permanent storage (fiscal year 1983 budget) | 199 | 267.0 | 343 | 417.0 | 456 | 538.0 | 598 | 623 | 670 | 750 | |
| Leased temporary storage [1] | | 41.5 | 75 | 110.5 | 181 | 208.5 | 152 | 127 | 80 | | |
| Total, SPR storage | 199 | 308.5 | 418 | 527.5 | 637 | 746.5 | 750 | 750 | 750 | 750 | |

## Table 1.—Leasing Costs to Achieve the 300,000-Barrels-Per-Day Fill Rate Goal Until 750,000,000 Barrels Are in the SPR—Continued

| | Fiscal year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Total |
| Cost of leased temporary storage (millions of constant 1982 dollars): [2] | | | | | | | | | | | |
| Above ground steel tanks: | | | | | | | | | | | |
| Assuming $1.80/barrel/year [3] | | 75.0 | 135 | 199.0 | 326 | 375.0 | 274 | 229 | 144 | | 1,757 |
| Assuming $2/barrel/year [4] | | 83.0 | 150 | 221.0 | 362 | 417.0 | 304 | 254 | 160 | | 1,951 |
| Oil tankers: [5] | | | | | | | | | | | |
| Assuming $3/barrel/year [6] | | 125.0 | 225 | 332.0 | 543 | 626.0 | 456 | 381 | 240 | | 2,928 |
| Assuming $3.65/barrel/year [7] | | 151.0 | 274 | 403.0 | 661 | 761.0 | 555 | 464 | 292 | | 3,561 |

[1] The total temporary storage needed to fill the SPR at a rate of 300,000 barrels per day is 975,500,000 barrels. It is assumed that temporary storage is needed for each full year; however, the actual capacity requirements would vary depending on deliveries.

[2] Does not include transportation costs.

[3] DOE officials stated in December 1981 that they believe DOE could lease between 10,000,000 and 30,000,000 barrels of capacity at a monthly cost of about 15 cents per barrel.

[4] In testimony before the Subcommittee on Fossil and Synthetic Fuels on Mar. 2, 1982, a representative of the Independent Fuel Terminal Operators Association cited a figure of $2 per barrel per year as a rate at which members of the association would be willing to lease space.

[5] According to H. P. Drewry's monthly report on "Shipping Statistics and Economics," worldwide there are 164 oil tankers of at least 100,000 deadweight tons (DWT) that are inactive—primarily either laid up or being used for oil storage. 1 DWT is equivalent to 7.3 barrels of storage capacity for Arabian light oil. According to the Drewry monthly reports and the Journal of Commerce, leasing rates for large tankers have generally ranged from $11,000 to $13,000 per day.

[6] Representatives of the Petroleum Industry Research Foundation and the Transportation Institute cited $3 per barel per year for leasing oil tanker storage capacity in testimony before the Subcommittee on Fossil and Synthetic fuels on Mar. 2, 1982. This is equivalent to tankers with an average size of 200,000 DWT (1,460,000 barrels) leased for $12,000 per day, or about 0.8 cents per barrel per day.

[7] GAO calculation based on an assumption of an average size of 150,000 DWT (1,095,000 barrels) leased for $11,000 per day, or 1 cent per barrel per day.

## Table 2.—Leasing Costs to Achieve the 300,000-Barrels-Per-Day Fill Rate Goal Until the First 500,000,000 Barrels Are in the SPR

| | Fiscal year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Total |
| Oil storage requirements (millions of barrels): | | | | | | | | | | | |
| Permanent storage (fiscal year 1983 budget) | 199 | 267.0 | 343 | 417 | 456 | 538 | 598 | 623 | 670 | 750 | |
| Leased temporary storage [1] | | 41.5 | 75 | 83 | 62 | | | | | | |
| Total, SPR storage | 199 | 308.5 | 418 | 500 | [2] 518 | 538 | 598 | 623 | 670 | 750 | |
| Cost of leased temporary storage (millions of constant 1982 dollars): [3] | | | | | | | | | | | |
| Above ground steel tanks: | | | | | | | | | | | |
| Assuming $1.80/barrel/year [4] | | 75.0 | 135 | 149 | 112 | | | | | | 471 |
| Assuming $2/barrel/year [5] | | 83.0 | 150 | 166 | 124 | | | | | | 523 |
| Oil tankers: [6] | | | | | | | | | | | |
| Assuming $3/barrel/year [7] | | 125.0 | 225 | 249 | 186 | | | | | | 785 |

Table 2.—Leasing Costs to Achieve the 300,000-Barrels-Per-Day Fill Rate Goal Until the First 500,000,000 Barrels Are in the SPR—Continued

| | Fiscal year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Total |
| Assuming $3.65/ barrel/year [8] | | 151.0 | 274 | 303 | 226 | | | | | | 954 |

[1] The total temporary storage needed to fill the SPR at a rate of 300,000 barrels per day is 261,500,000 barrels. It is assumed that temporary storage is needed for each full year; however, the actual capacity requirements would vary depending on deliveries.

[2] The additions to storage reflect deliveries of 50,000 barrels per day under the 5-yr contract with Pemex, Mexico's State oil company. These deliveries would require additional storage capacity over the previous fiscal year.

[3] Does not include transportation costs.

[4] DOE officials stated in December 1981 that they believe DOE could lease between 10,000,000 and 30,000,000 barrels of capacity at a monthly cost of about 15 cents per barrel.

[5] In testimony before the Subcommittee on Fossil and Synthetic Fuels on Mar. 2, 1982, a representative of the Independent Fuel Terminal Operators Association cited a figure of $2 per barrel per year as a rate at which members of the association would be willing to lease space.

[6] According to H. P. Drewry's monthly report on "Shipping Statistics and Economics," worldwide there are 164 oil tankers of at least 100,000 deadweight tons (DWT) that are inactive—primarily either laid up or being used for oil storage. 1 DWT is equivalent to 7.3 barrels of storage capacity for Arabian light oil. According to the Drewry monthly reports and the Journal of Commerce, leasing rates for large tankers have generally ranged from $11,000 to $13,000 per day.

[7] Representatives of the Petroleum Industry Research Foundation and the Transportation Institute cited $3 per barel per year for leasing oil tanker storage capacity in testimony before the Subcommittee on Fossil and Synthetic fuels on Mar. 2, 1982. This is equivalent to tankers with an average size of 200,000 DWT (1,460,000 barrels) leased for $12,000 per day, or about 0.8 cents per barrel per day.

[8] GAO calculation based on an assumption of an average size of 150,000 DWT (1,095,000 barrels) leased for $11,000 per day, or 1 cent per barrel per day.

## RECONCILIATION ACT FILL REQUIREMENT

**Mr. Yates.** How much of a mandate is this 300,000 barrels a day in the Reconciliation Act? Does it say you are to do it if you can do it?

**Mr. Furiga.** Seek.

**Mr. Yates.** "Seek to undertake and thereafter continue," I see. That is a direct charge telling him to do it, isn't it? Counselor, you are a pretty good lawyer, what is your interpretation of that? It says he should do it, doesn't it?

**Mr. Vaughan.** That is an interpretation, Mr. Chairman.

**Mr. Yates.** Well, look at it. I see you are a member of the Order of the Coif by your biography. That is a pretty good background.

**Mr. Vaughan.** But again, consistent with the decisions made in previous budget years, and the need to create the alternative to go into temporary or permanent storage which would require additional authority—we do not have authority to do that at this time.

**Mr. Yates.** Why didn't the President seek deferral, rescission or legislation that would change that basic law, rather than violating the law?

**Mr. Vaughan.** I do not believe he is violating the law. I believe he has seriously inquired into that. When this budget was put together, there were people less interested in a faster fill rate because the oil prices were much higher.

We have much more interest now, both in and out of the Administration, with oil prices declining at this time.

## RESPONSE TO MARKET CONDITIONS

**Mr. Yates.** Assuming that is true, why be inflexible? The point I am making is that the world is enjoying a glut of oil at the present time. Prices are lower than they have been in years.

Why aren't you buying more than you had been? Why aren't you stepping up purchasing?

Mr. **Vaughan**. Mr. Chairman, let me go back and restate, if I can.

Mr. **Yates**. All right.

Mr. **Vaughan**. We, in the program, are looking in as a response to that declining market, and we have told both the Senate this and your colleagues, I think we told your colleagues in the House Energy Committee, Mr. Chairman, that in response to recent market prices we are going back and looking at whether we ought to come back to the Congress and say we should respond to this market.

Mr. **Yates**. But why take so much time?

Mr. **Vaughan**. At the time this budget was put together——

Mr. **Yates**. When was this budget put together?

Mr. **Vaughan**. Last spring and summer, essentially.

Mr. **Yates**. A year ago?

Mr. **Vaughan**. Yes, sir, for all intents and purposes.

Mr. **Yates**. What were oil prices then? Were they much higher?

Mr. **Vaughan**. Yes, sir.

Mr. **Yates**. By the time you got through OMB, what were the oil prices, about the same as they are now?

Mr. **Vaughan**. No, sir. They were still holding reasonably high.

Mr. **Yates**. So, when OMB approved your financing level for purchase of oil, prices were high. Why didn't OMB send up a supplemental request to reflect the state of the world's oil prices?

Am I right in my interpretation that oil prices are much lower than had been anticipated, say, a year ago?

Mr. **Furiga**. Yes, they are, Mr. Chairman.

Mr. **Yates**. Shouldn't we be buying more oil now than we bought a year ago?

Mr. **Furiga**. We are buying oil consistently from our budget. As a matter of fact, while we are certainly not planning to buy the 300,000 barrels a day, our budget for fiscal year 1982 predicted that we would have approximately 267 million barrels in the ground by September 30.

We are running ahead of our development phase II caverns and we just bought another 6.25 million barrels last Thursday off the spot market at a very attractive price.

So we should have roughly 275 million barrels in the ground by September 30.

Mr. **Yates**. How many long-term contracts do we have at nonattractive prices? Do we have any?

Mr. **Furiga**. We do have one long-term contract which we feel is quite attractive, and that is the contract with PEMEX for 50,000 barrels.

Mr. **Yates**. With the Mexican Government?

Mr. **Furiga**. Yes.

Mr. **Vaughan**. One of the things you have to balance in a long-term program, Mr. Chairman, is that this market, of course, can go both ways.

So while it is very popular now to talk about buying vast, copious quantities, on the other hand, at the time the PEMEX contract was executed and even today with the way oil prices are, that is a respectable commercial contract considering it is long term.

So any time you engage in long-term contracting, you are trading some price protection against some supply security, which is primary in a program like this, of course; and again, this predated my appearance in the program, and I think the officials in the program did a very good job with that contract.

### INTERPRETATION OF RECONCILIATION ACT

Mr. **Yates**. Let's look at the law again. Tell us what that law means, counselor. One interpretation is that the President has to go out and do it. Right?

Mr. **Vaughan**. That is certainly an interpretation.

Mr. **Yates**. What is another?

Mr. **Vaughan**. That he shall look at the subject.

Mr. **Yates**. It doesn't say that, it says he will seek to do it. What is the language?

Mr. **Vaughan**. "Seek to undertake and thereafter continue subject to paragraph 2."

Mr. **Yates**. Sounds like a pretty active mandate, doesn't it? I have respect for your legal ability, but it seems to me you are struggling.

Mr. **McDade**. Would you yield, Mr. Chairman? Let me go back to law school with my friend, I can see why he is struggling.

If I wanted to make something absolutely mandatory, I would simply have said "shall" with no modification, wouldn't you?

Mr. **Vaughan**. Thank you.

Mr. **McDade**. That is a no-charge.

They modified that, didn't they, they said: Do your best. You shall do your best, seek to strive, do the best job you can.

They modified the word "shall."

Mr. **Vaughan**. I can't improve on that, Mr. Chairman.

Mr. **Yates**. Well, Mr. McDade——

### NPR/SPR OIL EXCHANGE

Mr. **McDade**. Let me go back to Elk Hills. My recollection is—correct me if I am wrong—when the skyrocketing oil prices hit us, it was decided not to advantage anybody in this country, or even to permit the military to take advantage of the low cost of Elk Hills oil relative to the rest of the world. Therefore, the way to deal with the Elk Hills production was to put it in the Strategic Petroleum Reserve.

What was the cost of Elk Hills oil, in 1980?

Captain **Gilmore**. Oh, probably about $26 a barrel.

Mr. **McDade**. $26 a barrel as opposed to a world price up around $37 a barrel or something like that?

Mr. **Furiga**. Yes, $35 or $36 a barrel.

Mr. **McDade**. Wasn't the justification at that time, then, that you couldn't advantage anybody by selling what was less than 100,000 barrels a day production in the commercial market of publicly owned property so the way to deal with it was to commingle it into a national reserve for the security of the Nation and not let anybody be advantaged by the price differential?

Captain **Gilmore**. I don't know how much price differential went into making the decision. However, I think some credibility was given the fact that the Nation put its own petroleum resources into the SPR, and this would probably be done without disturbing too many people.

Mr. McDADE. You would have a difficult time deciding who you will sell low-cost oil to if you auction it off?

Captain GILMORE. Our law requires when we sell the oil on the open market that we sell at the open market price. We are required to do that.

Mr. McDADE. What do you pay per barrel for putting it in the reserve?

Mr. FURIGA. We are not exchanging NPR crude. That was a one-time exercise. The vast majority of crude that went into the reserve has been from the open market.

Mr. McDADE. That was a one-shot deal.

Captain GILMORE. Yes.

Mr. McDADE. Your statement at page 5 shows 20.7 million barrels from NPR exchange agreements.

That was the 1980 agreements, right?

Mr. VAUGHAN. All we are trying to do there, Congressman, was account for all entries into the program. So that when your staff members totaled up the figures, they would match.

Mr. McDADE. So the 20.7 represents the one-shot 1980 decision to put it into the reserve?

Mr. FURIGA. Yes. Deliveries ran from September 1980 through October 1981. They spread throughout the year. That was it.

Mr. McDADE. Thank you.

Mr. VAUGHAN. I don't know whether you were present when the chairman and I were talking on this subject a few moments ago.

Mr. McDADE. I was here.

Mr. VAUGHAN. The long and short of it is that none of us sitting here know the rationale for that decision.

Mr. McDADE. That is why I was saying that my recollection is that it was decided not to get involved in the problem of relatively low-priced production at Elk Hills, but to put it in a reserve and benefit the Nation. I may be wrong on that. I was just speculating on the decision that was made in 1980.

Thank you, Mr. Chairman.

## INTERPRETATION OF RECONCILIATION ACT

Mr. YATES. Well, we have the question as to what to do with that provision of the law, though.

This doesn't give you any flexibility, does it?

Mr. McDADE. As I read it, Mr. Chairman, and we have a difference, you and I, but I think there is an enormous difference in the way the statute is written.

Mr. YATES. Why?

Mr. McDADE. By modifying the verb "shall." A great lawyer like Congressman Yates would never modify the word "shall" if he meant it to be inflexible and totally mandatory.

Mr. YATES. It says "shall."

Mr. McDADE. It is modified.

Mr. YATES. It doesn't say to the best of his ability.

Mr. McDADE. It says seek, strive.

Mr. **Yates**. Do your best.

Mr. **McDade**. Do your best, right.

Mr. **Yates**. But now we find out that he is not doing everything he can. I wonder why OMB doesn't send up a supplemental request.

With the market as good as it is now, shouldn't we be buying more? The reason that this committee agreed to put extra money in our 1982 appropriations bill was because the market was good.

We felt we should take advantage of a more favorable market and, therefore, we went over the budget to put money into the SPR for purchasing.

The question is, should we be doing that again? Is the market so good now that we ought to provide more funds for purchasing?

As reasonable men, should we provide the money for you to acquire more salt domes, and take steps to fill our Strategic Petroleum Reserves while we have a very favorable market?

That is the very argument, Mr. McDade, that you and I made to the Rules Committee.

Mr. **McDade**. Yes.

### OIL MARKET CONDITIONS

Mr. **Yates**. As a matter of fact, the market is more favorable now than it was last year when we went before the Congress to ask for more money for you, isn't that true?

Mr. **Vaughan**. Yes, sir.

Mr. **Furiga**. Yes.

Mr. **Yates**. Would we be less than wise if we just approved the OMB request and allow you to continue at this rate with the fairly certain expectation that the price will go up.

What's your guess as to what will happen in the future? You have to figure this out, don't you, in order to know when to buy, and how much to buy?

Mr. **Vaughan**. The best estimates we believe, Mr. Chairman, would be that we have gone through a decline of world oil prices. There are some who think we may go a little further.

Mr. **Yates**. Lower, you mean?

Mr. **Vaughan**. A little lower. I have seen projections as low as $20 a barrel, and I have seen quite a few as low as $25.

We are currently at $28 or thereabouts, that is the spot market, I think the consensus among those who forecast—I shouldn't say a consensus because they do vary quite a bit—but the majority would say that they expect that price, when it does bottom, to stay there for maybe a couple years.

Mr. **Yates**. Really?

Mr. **Vaughan**. That is a little more hazardous of a projection, but there is a lot of very thoughtful support for it. Then prices are expected to start off gradually back on an upward turn and I don't think anybody argues with that.

Mr. **Yates**. The question is: How much flexibility should you have in a market of this kind? Should the Congress give you an opportunity to go into the market with an appropriate amount of money—and I mean beyond that which you have requested—in order to fill the reserve much more quickly while the rates are favorable?

Mr. VAUGHAN. This is strictly my judgment——

Mr. YATES. That is what we are asking for.

Mr. VAUGHAN. The language we have been talking about was written at a time when prices generally were still fairly high.

I think the Congress was trying to tell the President and us in the program that it was the sense of the Congress that we should move along and fill that reserve, but they didn't want to lock us in place at high prices.

So they didn't mandate us into a high-cost oil acquisition.

There is a lot more revisiting of this question right now, more interest in it now that the prices are down. It is recognized that we have a decline in prices, and certainly we in the program are looking at interim storage and whether or not we ought to put something together to go back to OMB.

There are certainly many of your colleagues in both Houses of Congress asking exactly the same questions on both sides of the aisle.

That is the natural flow from low oil prices.

### OIL ACQUISITION FUNDING

Mr. YATES. You raise the question and the committee has to deal with that question now. Shall the committee do what it did last year? The conditions are even more favorable this year than those which prompted the committee to act last year to give you the flexibility to go into the market to buy.

### OMB CIRCULAR A-10 RESTRICTIONS

You can't tell us because you are sworn to uphold OMB's circular A-10. You can't give us the benefit of your judgment, can you?

Mr. VAUGHAN. I cannot prepare specific plans for you, no, sir.

Mr. YATES. Can you opine?

Mr. VAUGHAN. I have tried to candidly answer your question, Mr. Chairman, as you asked it.

Mr. YATES. What do you think of the committee calling in people like the oil expert from New York, John Levy, is it?

Mr. VAUGHAN. Levy is one.

Mr. YATES. And there are other experts we could contact for advise on what our course of action should be. OMB will not allow Congress the benefit of your opinions.

### WORLD OIL PRICES

At any rate, let's go on. There is a drop in world oil prices, we have discovered. So, why is there a drop in the amount of money requested for oil acquisition and transportation?

Mr. FURIGA. It is because of that fact—the oil price assumptions that we used last year are now lower and you can purchase more oil with your dollar.

Mr. VAUGHAN. Again, Mr. Chairman, what the program is doing in this year and next is operating at capacity fill. In other words, it is limited by the amount of storage capacity and the time it takes to fill the storage to capacity.

The lid is really the natural result of three previous years' budget decisions, and the only way to get around that is to go to interim or temporary storage, which I described earlier.

I might say, also, that were we to do that, we should come out of interim storage as rapidly as possible in order to incur the least cost.

Mr. YATES. This is called the Strategic Petroleum Reserve. Perhaps we ought to find a way to transfer Department of Defense funds for that purpose.

[Mr. Vaughan raised his eyebrows and made no comment.]

### ACCELERATED STORAGE

There is an article in the National Journal that you have a report on how accelerated storage development might be accomplished. Is that correct?

Mr. VAUGHAN. I believe that was the last report issued about the middle of last summer.

Mr. YATES. Is it still in point?

Mr. VAUGHAN. Yes, yes.

Mr. FURIGA. Yes.

Mr. VAUGHAN. I think the general thrust, the numbers may be off with the change in year.

Mr. YATES. Could you bring that up to date and expand it to indicate the availability of outside storage?

Mr. FURIGA. This is a study on accelerating permanent storage, Mr. Chairman.

Mr. YATES. I know.

Mr. VAUGHAN. Well, the simple answer to the question is, yes, it could be done.

Mr. YATES. Sure, because you have indicated there are salt domes that are available in private hands.

Mr. FURIGA. There might be, Mr. Chairman, might be available.

Mr. YATES. All right, you haven't undertaken to negotiate for them or to lease any of them——

Mr. FURIGA. No, sir.

Mr. YATES. ——because you are adhering to a schedule, and the amount of appropriations requested in that schedule won't permit you to go outside to do that, right?

Mr. VAUGHAN. Correct.

Mr. YATES. Okay.

Would you make a copy of that study available to the committee, please?

[The information follows:]

### SPR ACCELERATION REPORT

A copy of the Strategic Petroleum Reserve Acceleration Report to the Secretary, dated July, 1981, is being provided to the Committee as requested.

# STRATEGIC PETROLEUM RESERVE ACCELERATION
# REPORT TO THE SECRETARY

July 1981

Strategic Planning and Analysis Division
Strategic Petroleum Reserve Office

# PREFACE

This study assesses the relative effects of specific Strategic Petroleum Reserve configuration and schedule alternatives. It employs strategic and economic assumptions specifically designed to illustrate differences among alternatives. The assumptions do not, in their absolute form, necessarily represent official Department of Energy projections or planning parameters.

## EXECUTIVE SUMMARY AND CONCLUSIONS

### SUMMARY

The purpose of this Report is to provide information for use by the Department of Energy and the Executive Office of the President for deciding on changes to the development plan for the Strategic Petroleum Reserve (SPR) presented in the March 10, 1981 President's Budget for 1982. This Report is intended to support the needs for the FY 1983 Planning, Programming and Budgeting process and to satisfy a request by the Office of Management and Budget of March 24, 1981 for a study by August 1 "of all alternatives for accelerating the facilities development schedule so as to increase U.S. protection against supply interruptions in the near term."

The prior Administration had approved completion of a 750 MMB government-owned, centralized crude oil storage program in 1989 with 420 MMB in storage capacity available by the end of calendar year 1985. Under this plan the development of the Reserve would take place in three phases: Phase I, consisting of a 250 MMB storage capacity, Phase II, consisting of a 290 MMB storage capacity, and Phase III encompassing a remaining 210 MMB storage capacity.

Phase I has been completed. Moreover, over 75 percent of the $702 million appropriated for Phase II has already been obligated. As a consequence, this part of SPR development is treated as a given, being included on all the alternatives considered.

Phase III development is scheduled to commence in FY 1982. One element of the Phase III plan--the 40 MMB expansion of Bryan Mound--was considered as given because of the clear cost-effectiveness of this expansion. The other two Phase III elements--the 30 MMB expansion of West Hackberry and the development of a new 140 MMB site at Big Hill--were not considered as given. Rather, they were evaluated along with other facilities development options.

In light of these above considerations, a 580 MMB base module consisting of Phase I (250 MMB), Phase II (290 MMB), and Phase III, (Bryan Mound) (40 MMB), was developed. Beyond this 580 MMB base module, additional incremental modules were evaluated. These additional incremental modules are summarized in the following table:

Summary of Incremental Modules

| Increment | Size (MMB) |
|---|---|
| (1) West Hackberry, Phase III | |
| a. Coexpansion with Phase II | 30 |
| b. Deferred expansion | 30 |
| (2) Big Hill | |
| a. 100 MMB | 100 |
| b. 140 MMB | 140 |
| (3) New Solution-Mined Site | 120 |
| (4) Cote Blanche | 40 |
| (5) Steel Tanks | |
| a. 40 MMB (FY 82 Budget) | 40 |
| b. 30 MMB (FY 83 Budget) | 30 |

Costs per barrel for each of these increments were compared in terms of budget and real dollars and present value terms. The above increments were also evaluated according to several measures that consider both costs (facility and oil costs) and benefits represented as either incremental capacity added annually or cumulative barrels of capacity at the end of each year.

The development schedules utilized for the study are based on the maximum development rate deemed technically feasible. The possibility of accelerating development by such measures as waiver of Federal environmental and procurement requirements and accelerating the procurement process was also examined. For the existing planned development, much of environmental and procurement work has been accomplished and therefore not at issue. For new development, it is not presently foreseeable that these requirements will be constraining in most cases. Thus, we can not at this time identify quantifiable gains which would be achieved through measures of this kind. However, it should be recognized that delays in schedules utilized for this study can result from environmental, procurement, or other problems and relief then may become necessary in order to maintain the schedules.

The criteria used for ranking these individual increments to the 580 MMB Base Module were as follows:

- minimization of the unit cost of facilities in nominal dollars, real dollars, and the present value of real dollars;
- minimization of real dollar program (oil plus facilities) cost per-barrel;
- maximization of the ratio of discounted facility capacity increments to present value of facilities costs, for all discount rates; and
- maximization of the ratios of discounted barrel-years of protection to total program investment value (present value of facilities and oil costs net of salvage value) up to, and including, benefit discount rates of 10 percent per year.

After the individual increments were ranked, five SPR systems alternatives were developed for further evaluation.

(1) a 750 MMB system--consisting of the Base Module (580 MMB); plus the 30 MMB coexpansion of West Hackberry; plus the development of 140 MMB capacity at Big Hill.

(2) a 790 MMB system--consisting of the above-mentioned 750 MMB system; plus Cote Blanche (40 MMB).

(3) an 890 MMB system--consisting of the above-mentioned 790 MMB system; plus 100 MMB of steel tanks.

(4) a 1,000 MMB system--consisting of the above-mentioned 890 system; plus a new 110 MMB solution-mined site.

(5) a 1,000 MMB system--consisting of the 890 MMB system defined in (3); plus 110 MMB of steel tanks.

These five SPR systems were evaluated in terms of their net benefit stemming from an oil supply shortfall. A computerized decision model--

developed for the Policy, Planning, and Analysis Office of the department by Professor Tom Teisberg, of MIT--was used to estimate these economic loss reductions.

The Teisberg model evaluated each of the SPR system alternatives in terms of net economic benefit implicit at various statistical assumed probabilities for an oil supply interruption occurring during the lifespan of the SPR project. The results of this evaluation are ranked ordinally in the table below with the alternative system expressing the largest net economic benefit being ranked number one.

**Rank Ordering of the Results of the Teisberg Model Analysis**
**According to Size of Consumer Surplus Loss Avoided**

| Assumed Probability of Oil Supply Shortfall | | System Project Alternatives | | | | |
|---|---|---|---|---|---|---|
| Yearly | Project Life[1] | (1) 750 | (2) 790 | (3) 890 | (4) 1,000 | (5) 1,000 |
| | | | | (tight market)[2] | | |
| 0.0 | 0.0 | N/A | N/A | N/A | N/A | N/A |
| 1.0 | .21 | 1 | 2 | 3 | 4 | 5 |
| 2.0 | .38 | 1 | 2 | 3 | 4 | 5 |
| 3.0 | .48 | 4 | 2 | 1 | 3 | 5 |
| 4.0 | .62 | 5 | 4 | 3 | 1 | 2 |
| 5.0 | .71 | 5 | 4 | 3 | 2 | 1 |
| 10.0 | .92 | 5 | 4 | 3 | 2 | 1 |
| 15.0 | .98 | 5 | 4 | 3 | 2 | 1 |
| 20.0 | .99+ | 5 | 4 | 3 | 2 | 1 |
| | | | | (slack market) | | |
| 5.0 | .71 | 5 | 4 | 3 | 2 | 1 |
| 10.0 | .92 | 5 | 4 | 3 | 2 | 1 |
| 15.0 | .98 | 5 | 4 | 3 | 2 | 1 |
| 20.0 | .99+ | 5 | 4 | 3 | 2 | 1 |

[1] Project life of 24 years running from 1981 to 2004 inclusive; expresses the statistical chance of encountering at least one such oil supply shortfall.

[2] The terms "slack" and "tight" refer to alternative market conditions when SPR oil is being purchased. Under a slack market, such as at the present, SPR oil purchases do not increase market prices and thereby affect the cost to the U.S. economy or private sector oil imports. Under tight market conditions, SPR purchases do increase market prices and therefore represent a conservative assumption regarding the net economic benefits of various SPR system configurations

The above results indicate that increases in the assumed probability of a shortfall justify progressively greater SPR sizes.

## CONCLUSIONS

This study yields the following conclusions:

(1) the 750 MMB program contained in the FY 82 budget cannot be further accelerated to any significant degree and its composition is the most cost-effective 750 MMB system.

(2) under most circumstances, Cote Blanche is the most attractive increment to the existing elements of the current 750 MMB system for expansion to 790 MMB.

(3) beyond a 790 MMB system, if protection against an oil supply interruption during the 1980's is sought, then steel tanks are preferred. However, if the protection desired extends through the entire century, then a new solution-mined site is more cost-effective.

(4) 1,000 MMB SPR is economically justified if the expected probability of an oil supply cut-off is at least 4 percent per year (implying a 62 percent likelihood of at least one such occurrence over the 24-year lifespan of the SPR project).

(5) then 790 MMB and 890 MMB systems are economically justified if the expected probability of an oil supply cut-off is at least 3 percent per year (implying a 48-percent probability of at least one shortfall during the project life).

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# SECTION I

# INTRODUCTION

## PURPOSE OF THE REPORT

This Report was prepared for use by the Department of Energy and the Executive Office of the President in making decisions on whether to change the plan for Strategic Petroleum Reserve (SPR) development which was embodied in the March 10, 1981 President's Budget for FY 1982. It is intended to satisfy the needs of Department of Energy decision makers for the FY 1983 Planning, Programming, and Budgeting process and to satisfy the request of the Office of Management and Budget of March 24, 1981 to "prepare a study, by August 1, of alternatives for accelerating the facilities development schedule so as to increase U.S. protection against supply interruptions in the near term."

## APPROACH TO THE PROBLEM

The current Administration inherited from the prior Administration a Strategic Petroleum Reserve (SPR) facilities development plan which would result in completion of a 750 MMB government-owned, centralized crude oil storage program in 1989, with 420 MMB in storage capacity available by the end of calendar year 1985. The Energy Policy and Conservation Act of 1975 had set a minimum target of 500 MMB in storage by the end of 1982, and the Carter Administration had, in the 1977 National Energy Plan and in SPR Plan Amendment No. 2, set a goal of 1 billion barrels in storage by 1985, and described a plan for a 750 MMB government-owned system to be completed by that year.

The reasons for the delays of prior years will not be discussed at length in this paper. Rather, we will focus on the remaining options available in 1981 for future decisions to alter the SPR development program.

The SPR program as set forth in the FY 1982 budget is being developed in three Phases. Phase I involved the conversion for hydrocarbon storage of existing salt caverns at five storage sites, plus the development of transportation facilities to connect the storage sites to major elements of the U.S. crude oil distribution system. In the FY 1982 budget, the capacity of Phase I was set at 248 MMB; in this report, due to more recent analysis, the Phase I capacity is rated at 250 MMB.

Phase I storage site development is complete and available for fill during the FY 1981-2 period, though limited facilities funding actions continue as the courts render judgment on the real-estate condemnation cases. Physically, Phase I capacity and schedule are considered as given for purposes of this review.

Phase II consists of a further 290 MMB in capacity developed at three of the Phase I storage sites: West Hackberry (160 MMB), Bryan Mound (120 MMB) and Bayou Choctow (10 MMB). Generally, Phase II expansions are being carried out through solution-mining (leaching) new storage capacity, involving the drilling of wells into the salt formation, the development of fresh water intake capabilities to inject fresh water into the salt, and the disposal of saturated brine. Of the $702 million estimated cost to complete Phase II, over 75 percent or $527 million has already been appropriated and will be obligated by the end of FY 1981. Surface facilities development is nearing completion and leaching has commenced at both Bryan Mound (in 1980) and West Hackberry (in 1981).

Given the sunk costs and progress to date on Phase II, this study does not consider alternatives for major changes to the basic plan for the configuration of Phase II. However, one opportunity for acceleration of a portion of Phase II has been identified. Since the brine disposal pipeline at Bryan Mound was designed for a higher flow rate then allowed by the current EPA discharge permit, the Department of Energy, in February, 1981, applied for a change in the permit to allow brine discharge into the Gulf of Mexico at a daily average rate of 980 MBD, in comparison to the current permitted rate of a maximum of 680 MBD on each day. Assuming approval of this application, the change in the terms of this permit plus the addition of some pumps late in 1981 will accelerate the completion of the Bryan Mound Phase II and, as discussed below, Phase III capacity. The revised schedule estimates for Phase II in this paper are predicated on approval of this permit modification.

Phase III, in the FY 1982 budget, was planned to include the following elements:

- Further expansion of Bryan Mound by 40 MMB.
- Further expansion of West Hackberry by 30 MMB.
- Development of a new 140 MMB "grass roots" solution-mined site.

Because of the aforementioned increase in the brine disposal rate at Bryan Mound, the Phase III expansion of Bryan Mound will be cost-effective and timely in relation to the Phase III expansion of West Hackberry. Therefore, for purposes of this review, we have assumed a "Base Module" of 580 MMB, which will remain unchanged throughout the analysis. The base system consists of the following elements:

| | (MMB) |
|---|---|
| Phase I | 250 |
| Phase II | 290 |
| Phase III Bryan Mound | 40 |
| Base System Total | 580 |

Table I compares this Base Module to the FY 1982 budget baseline estimates for the oil fill capability schedule for the 750 MMB system. It illustrates the significant fill capability gains that can be achieved through 1986 through the revisions in the Bryan Mound brine disposal rate. Some of these gains are also attributable to the deletion of West Hackberry Phase III which, in the FY 1982 baseline, was proposed for development simultaneously (termed coexpansion) with West Hackberry Phase II. The coexpansion of West Hackberry Phases II and III actually results in a temporary retardation of Phase II fill capability in the 1984-1986 period.

The 580 MMB Base Module is held constant throughout the analysis with increments of storage development added thereto.

## Table I.1 Strategic Petroleum Reserve Fill Capability

Comparison of the FY 1982 Baseline to the Base Module
(Cumulative MMB, End of Fiscal Year)

| | | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|---|
| FY 1982 | | | | | | | | | | |
| (a.) | Baseline | | | | | | | | | |
| | Phase I | 248 | 248 | 248 | 248 | 248 | 248 | 248 | 248 | 248 |
| | Phase II | --- | 13 | 83 | 151 | 157 | 203 | 274 | 290 | 290 |
| | Phase II | --- | --- | --- | | 4 | 30 | 83 | 149 | 212 |
| | Total | 248 | 261 | 331 | 398 | 409 | 481 | 605 | 687 | 750 |
| (b.) | Base Module | | | | | | | | | |
| | Phase I | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | Phase II | 1 | 17 | 93 | 166 | 205 | 273 | 290 | 290 | 290 |
| | Phase III (BM) | --- | --- | | 1 | 12 | 40 | 40 | 40 | 40 |
| | Total | 251 | 267 | 343 | 417 | 467 | 563 | 580 | 580 | 580 |
| | Percent/ (a) to (b) | 0.99 | 0.98 | 0.97 | 0.95 | 0.88 | 0.55 | 1.04 | 1.18 | 1.29 |

Section II, backed up by the Appendix A, defines the alternative increments to the 580 MMB Base Module and presents the budget and fill schedule data associated with each.

Section III is an analysis of each alternative increment based on various evaluation measures. These measures compare benefits, represented by either annual or cumulative fill capability, to the present value of cost of facilities or facilities and oil. This is not a net economic benefits analysis because the costs and benefits are not presented in commensurable terms. Rather, Section III attempts to rank alternatives in terms of the relationship of the fill capability schedule to the present value of costs.

Section IV presents some overall system configuration alternatives combining the 580 MMB Base Module with the alternative facilities increments ranked in Section III.

Section V uses the Teisburg model to compare the net economic benefits of the alternative system configurations presented in Section IV.

# SECTION II

# DESCRIPTION OF ALTERNATIVE INCREMENTS TO THE BASE MODULE

## OVERVIEW

This section describes the alternative SPR storage facility increments that could be added to the Base Module described in Section I.

The early (1974-75) National Petroleum Council Studies recommended that the SPR stockpile be stored in large salt caverns in the Gulf Coast area, and SPR planning by the Federal Energy Administration led to the identification of numerous salt dome formations along the Gulf Coast. The current 750 MMB SPR configuration is the result of a process of elimination among candidate salt domes using a specific set of criteria, among which facilities development cost emerged as a priority determinant in site selection.

From time to time during this process, there has been interest in finding alternative sites and/or storage media that would enhance the SPR schedule. In 1978 a rigorous process was initiated to obtain and evaluate industry offers to develop SPR storage facilties on a "turnkey" basis. This "turnkey" procurement was cancelled in 1979, basically because the curtailment of SPR oil fill by the Carter Administration made it unclear that it was worth spending money to accelerate facility capacity due to the potential that the facilities would be left temporarily unfilled, and because the "turnkey" proposals seemed to lack advantages over conventional site development.

Other proposals for alternative SPR facilities have been raised from time to time, including the use of conventional above-ground steel tanks, the leasing of storage capacity from the private sector, and the use of oil tankers for floating storage, a method employed by the Japanese government.

The government's procurement, environmental, and budget processes are such that there is a considerable delay from the time a concept is articulated to the time a funded construction project is underway. In addition to the passage of time for these processes to run their course, new uncertainties emerge about the basic viabilty of a new or different concept, just as the oil acquisition curtailment introduced new uncertainties into the SPR competitive turnkey procurement process.

Therefore, while not completely disregarding the possibility that there may, in fact, be some low-cost attractive schedule facilities alternatives "out there", we have confined our analysis to facilities options about which enough is known to permit decision making in 1981 with a relatively high degree of confidence. Specifically, we have looked at alternative configurations of development for the SPR projects that are within the 750 MMB FY 1982 baseline system but outside the 580 MMB base module. In addition, we have revisited the possibility, first raised about 5 years ago, of converting the Cote Blanche salt mine for oil storage. Finally, in part with the assistance of the Corps of Engineers, we have developed cost and schedule prototypes of two known methods of oil storage--development of another large underground salt dome site through solution-mining and development of some large but technically conventional steel tank storage sites.

The schedules for each increment are based on the maximum development rate deemed technically feasible. As mentioned previously, leaching rates, one of the principal determinants of schedule, are being accelerated to the full capability of brine disposal systems currently developed.

We have also reviewed the possibility of accelerating development of each alternative increment by administratively or legislatively waiving existing environmental, permitting, land acquisition and procurement requirements. However, while such factors could prove constraining, we presently can not quantify significant acceleration from such action for these reasons:

(1) A large number of these requirements on existing planned development will be satisfied by the end of FY 81.

(2) An environmental impact statement has already been prepared for Cote Blanche, a former "turnkey site", for 30 MMB. Only a supplemental to the existing EIS would be required for the 40 MMB site.

(3) New developments such as steel tanks and a new solution-mined site will not benefit from waiving requirements in these areas because they are not on the critical path or because so far as currently can be determined they are already at the maximum feasibile rate of development.

A more detailed assessment of the effect on the development schedule for each alternative increment of complying with existing requirements in these areas and the scheduling assumptions used are presented in Appendix B.

Not withstanding the above comments, waivers of environmental requirements could become desirable if any major impediments to acquiring approval to proceed with a given development should occur. However, such contingencies would apply across all alternatives and would be addressed on a case-by-case basis.

None of these alternatives is risk-free, but we have tried to build in reasonable contingency factors in cost and schedule estimates. The following is a brief description of each of these alternatives.

(1) FURTHER EXPANSION OF WEST HACKBERRY

West Hackberry is the largest planned SPR site; it now has a Phase I capacity of 48 MMB and is planned for expansion by 160 MMB as part of Phase II. Phase II leaching actually commenced in May 1981, the surface construction having been substantially completed during 1980 and early 1981. Adding three new caverns (30 MMB) to this site in Phase III, as planned in the 1982 budget, is a relatively straightforward matter of drilling additional wells, developing tie-ins to other site piping, electrical, and instrumentation systems, and using existing fresh water intake, brine disposal, and crude oil transportation infrastructure to complete the leach fill process.

Two expansion subalternatives have been identified:

(a) Coexpansion: This involves leaching the three Phase III caverns in tandem with the second group of Phase II caverns, resulting in operational efficiencies but retarding Phase II cavern development.

(b) Deferred leaching: This involves waiting for the Phase II caverns to be completed before leaching the Phase III caverns.

This decision does not have to be made until 1983, but we have used both subalternatives in the evaluation to permit a fair comparison of the West Hackberry increment to other alternatives.

(2) BIG HILL

The Big Hill salt dome was identified as a candidate SPR site very early in the SPR planning process. In the FY 1982 budget, it is proposed for development to a 140 MMB size as part of Phase III. Considerable environmental analyses have been completed on Big Hill, and a process has been established for selecting an architect/engineer. However, major capital commitments, such as land acquisition, have not yet been made so Big Hill was not included in the 580 MMB Base Module.

As with West Hackberry, two subalternatives have been identified for Big Hill.

(a) 100 MMB: This involves the development of only 10 caverns at Big Hill, without a change in the overall site brine disposal capabilities, permitting the average cavern to develop at a faster rate. However, since the infrastructure is about the same as for the 140 MMB size, the unit costs of developing a 100 MMB size tend to be higher.

(b) 140 MMB: This is the proposal in the FY 1982 budget.

We have not evaluated a reconfiguration of the 140 MMB project, which would entail leaching the first 100 MMB at a faster rate as in subalternative (a), deferring leaching of the other 40 MMB. The decision would not need to be made for several years. The availability of the FY 1982 budget funding requested for Big Hill is assumed for both cases.

(3) NEW SOLUTION-MINED SITE

This entails the development of a new solution-mined SPR facility, beginning in FY 1983, to the level of 120 MMB, at a site which has not been identified and where no site-specific cost, design schedule, or environmental analyses have been conducted.

(4) COTE BLANCHE MINE

This is the conversion to hydrocarbon storage of the Cote Blanche mine, a conventional salt mine near the existing SPR Weeks Island site in southern Louisiana.

Cote Blanche is an operating salt mine that had been identified some years ago and considered for SPR use. The owners and operators were contacted at that time and some negotiations were conducted until late 1979. The fact that the property is owned by two family trusts which have been unwilling to sell, and that the operator's lease rights are limited, made it very difficult to negotiate a satisfactory acquisition. Condemnation of the site could prove necessary and it would be difficult to assure continued salt mining operations elsewhere by the current operator. Unemployment and lost salt production could result, and the operator, a Canadian company, previously threatened diplomatic repercussions. Also, the taking of this site could be alleged to violate a February, 1978 "best efforts" agreement between former DOE Deputy Secretary O'Leary and Louisiana's then--Governor Edwards that "DOE use of . . . salt Dome(s) . . . will be acceptable to the State, so long as no employees of industries utilizing the Domes are displaced in their jobs."

Some years ago, Cote Blanche was thought to have a capacity of over 30 MMB, but we have estimated the future capacity at 40 MMB, based on continued mining in the interim.

(5) STEEL TANKS

Working with the Corps of Engineers, we have developed prototype cost and schedule estimates for both a 40 MMB and a 30 MMB steel tank storage site. In both cases we assume the use of large (1.25 MMB) steel tanks developed in 5 MMB modules in series. The first module on a site thus becomes available for fill while subsequent modules are being developed.

For the 40 MMB module we are assuming nearly full-funding in FY 1982 to be followed by funding for the 30 MMB module in FY 1983. Changes in funding and schedule for both are possible, and further increments can be added to this 70 MMB to achieve higher levels. However, while site selection activities have not been undertaken, one could assume that each incremental site required to achieve higher total storage levels would involve greater cost/schedule/environmental trade-offs. A 40 MMB steel tank storage site, although much smaller than the average SPR Base Module site, is a visibly large government development activity.

Table II.1 sets forth the oil fill capability schedule for each increment to the Base Module. Table II.2 sets forth the facilities development budget requirements for each, and Table II.3 sets forth the ultimate oil budget costs of each. Oil acquisition budget authority and outlay timing has not been estimated for separate modules, but has been addressed in the evaluation of alternative SPR systems.

Table II.3. Strategic Petroleum Reserve Oil Costs
(nominal[1] dollars in millions)

| | MMB | COSTS |
|---|---|---|
| Base Module | 580 | 25,037[2] |
| West Hackberry | | |
| Coexpansion | 30 | 2,164 |
| Deferred | 30 | 2,169 |
| Big Hill | | |
| 100 MMB | 100 | 6,833 |
| 140 MMB | 140 | 10,107 |
| New Solution-Mined Site | 120 | 9,223 |
| Cote Blanche | 40 | 2,141 |
| Steel Tanks | | |
| 40 MMB | 40 | 2,497 |
| 30 MMB | 30 | 1,811. |

[1] Using price assumptions from the March 10, 1981 President's Budget revisions.

[2] Reflects deduction of the entitlements benefits through July, 1980 (ESA passage), but includes full cost of oil after July, 1980 ($542 million benefit not deducted).

# SECTION III

# EVALUATION OF ALTERNATIVE INCREMENTS TO THE BASE MODULE

## APPROACH

The purpose of this section is to evaluate the alternative facility development increments from the standpoint of both cost and schedule, to identify logical rankings of increments as the basis for identifying SPR configuration/size alternatives in Section IV.

There are a number of different criteria that one could apply to the ranking of alternative increments. Not all criteria result in the same rankings as will be illustrated in this section. Rather than argue for one particular ranking method, we have chosen to employ multiple methods to discover whether there are some logically least and most preferrable alternatives on a weight-of-the-evidence basis.

## MINIMIZATION OF THE COST OF FACILITIES

Under this approach, one seeks to minimize the cost of SPR facilities on a per-barrel basis, independent of trends in oil prices and decisions on SPR oil acquisition. This analysis is also independent of schedule except to the degree that the present value of facilities costs is affected by the timing of financial outlays.

Table III.1 presents the per-barrel costs of each facilities increment in budget (escalated) dollars, real 1981 dollars, and the present value in 1981 of the real dollar cost stream, using a 10 percent discount rate.

The following conclusions can be drawn from Table III.1 in terms of the unit costs of facilities alone.

(1) Whether one is concerned with minimizing budget costs, real dollar costs, or present value of real dollar costs,

   (a) Both West Hackberry expansion subalternatives are the cheapest form of facilities development, and

   (b) Steel tank development costs are the most expensive.

(2) The development of Big Hill is cheaper than the development of a new solution-mined site except that the extended nature of the development of a new site reduces the present value of its cost stream below that of Big Hill 100.

(3) In terms of budget dollars, Cote Blanche is slightly cheaper than both Big Hill alternatives because it involves a faster spend-out, but in terms of real-dollar costs, Cote Blanche tends to fall between the Big Hill 140 and Big Hill 100 alternatives.

## MINIMIZATION OF THE PER-BARREL COST OF FACILITIES AND OIL

Since oil acquisition will represent over 90 percent of the total costs of the SPR, it is logical to consider both facilities and oil costs in ranking configuration options. Table III.1 illustrates that alternatives with higher facilities costs can have lower overall budget costs, assuming that oil prices increase as projected in the March 10, 1981 President's budget.

(1) Cote Blanche becomes the least expensive alternative in terms of budget costs and real dollar costs on a per-barrel basis, even less costly than the West Hackberry expansion.

(2) In those same terms, steel tanks are less expensive than a new solution-mined site and competitive with Big Hill alternatives, because the oil would be acquired sooner.

(3) The Big Hill 100 MMB subalternative becomes more competitive with the 140 MMB subalternative.

(4) The use of the present value measure of cost substantially changes the rankings from those which result from use of nominal and real dollar measures. The more accelerated alternatives--Cote Blanche and steel tanks--become the most costly. The new solution-mined site, where fill is not complete until 1990, is one of the least expensive alternatives. The reason for these changes is that the oil price projections assume 3 percent annual real growth, while the real discount rate is set at 10 percent, the standard Federal benefit/cost analysis time preference criterion. Therefore, accelerated oil purchases actually increase the present value of oil costs.

It should be noted that per-barrel salvage values have not been netted out of the oil costs for this particular analysis. This does not affect relative rankings because the per-barrel oil salvage value would be the same for all alternatives.

Figure III-1 traces the relative rankings of the alternatives using the different per-barrel cost measures.

## MAXIMIZATION OF THE RATIO OF FACILITY FILL CAPABILITY SCHEDULE TO THE PRESENT VALUE OF FACILITIES COSTS

As noted above, the introduction of the present value measure into the evaluation of total program costs tends to penalize the more accelerated alternatives without considering the benefits as well as costs of acceleration. To help correct for this problem, we have developed a ranking measure which is a ratio, expressed as a percentage, of the incremental barrels of storage capacity discounted at various rates to 1981 (present value of benefits) to the present value of facilities costs for each alternative.

The merits of this evaluation measure are that it addresses directly the benefits and costs of the near term investment decision being made on facilities development. It assumes nothing about oil cost trends or oil fill schedule but addresses how, by spending alternative amounts for facilities, one can affect the timing of fill capability.

Table III.2 assesses the alternatives in terms of this measure for five different benefit discount rates. Costs remain discounted at 10 percent, irrespective of benefit discount rates. It should be noted that with a 0 percent benefit discount rate, the benefit of each alternative is rated as its total capacity irrespective of schedule. Thus the benefit/cost ratio is actually the inverse of the per-barrel present value cost of facilities, expressed as Table III.1. At higher benefit discount rates, the benefits of each alternative capacity decline below total capacity in accordance with the timing of development.

The following conclusions can be drawn from Table III.2 and Figure III.2, which illustrate these same phenomenon in graphic form.

(1) For all benefit discount rates, the West Hackberry expansion sub-alternatives remain the most cost-effective.

(2) Steel tanks are the least cost-effective in terms of this measure for all benefit time preferences, though with a strong (20 percent) preference for benefit acceleration, steel tanks become competitive to the development of a new solution-mined site.

(3) Cote Blanche is more cost-effective than either Big Hill 100 or Big Hill 140 with a 10 percent or higher benefit discount.

(4) Big Hill 140 remains relatively more cost effective than Big Hill 100 throughout all benefit discount rates.

## MAXIMIZATION OF THE RATIO OF THE END-OF-YEAR FILL CAPABILITY SCHEDULE TO THE PRESENT VALUE OF FACILITIES AND OIL COSTS

We also computed a similar evaluation measure as the one above expressed as a ratio of the total cumulative storage capability discounted at various rates to 1981 to the present value of facilities and oil costs for each

### Table II.1 Strategic Petroleum Reserve Fill Capability
### Base Module and Effects of Alternative Facility Increments
### Cumulative MMB, End of Fiscal Year

| Increment (Yr of Initial Funding) | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| Base Module | 251 | 267 | 343 | 417 | 467 | 563 | 580 | 580 | 580 | 580 |
| (1) West Hackberry Expansion | | | | | | | | | | |
| COEXPANSION (FY 82) | - | - | - | - | -11 | -25 | +18 | +30 | +30 | +30 |
| DEFERRED (FY 84) | - | - | - | - | - | - | 1 | 14 | 30 | 30 |
| (2) Big Hill | | | | | | | | | | |
| 100 MMB (FY 82) | - | - | - | - | - | 1 | 25 | 100 | 100 | 100 |
| 140 MMB (FY 82) | - | - | - | - | - | - | 13 | 60 | 140 | 140 |
| (3) New Solution Mined-Site (FY 83) | - | - | - | - | - | - | - | 14 | 60 | 120 |
| (4) Cote Blanche (FY 82) | - | - | - | 18 | 40 | 40 | 40 | 40 | 40 | 40 |
| (5) Steel Tanks | | | | | | | | | | |
| 40 MMB (FY 82) | - | - | - | - | 8 | 20 | 32 | 40 | 40 | 40 |
| 30 MMB (FY 83) | - | - | - | - | 8 | 20 | 30 | 30 | 30 | 30 |

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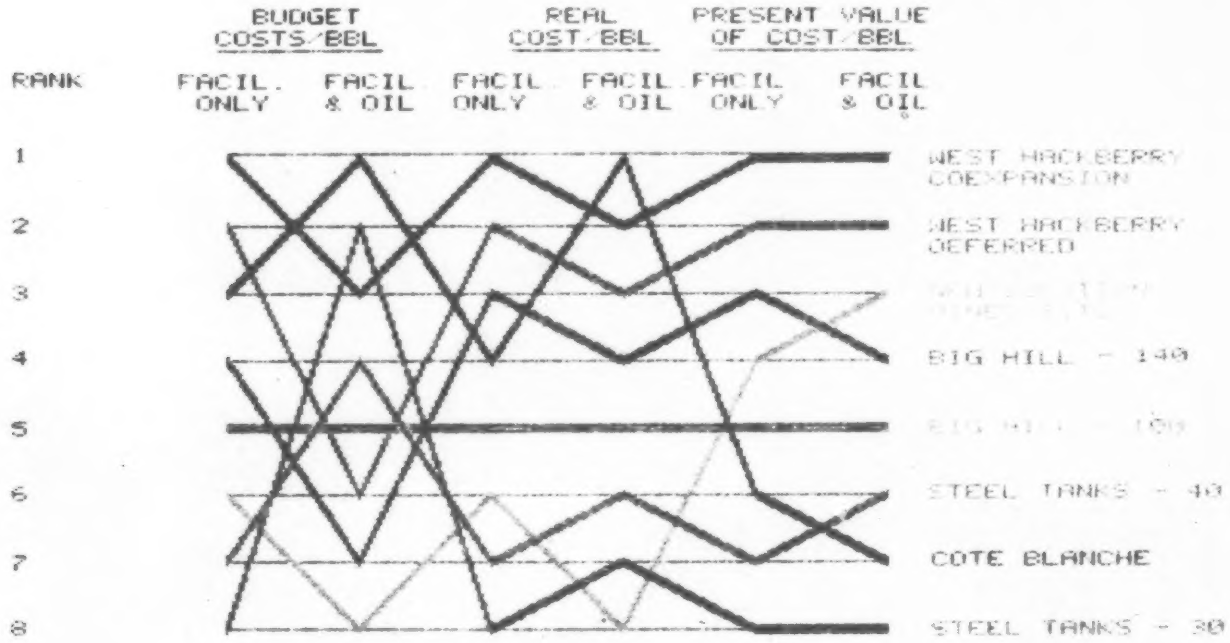
### Table II.2 Strategic Petroleum Reserve Facilities Development and Operations Budget
### Base Module and Effects of Alternative Facilities Increment
### (In Millions of Dollars)

| | | Prior Years | FY 1982 | FY 1983 | FY 1984 | FY 1985 | Fy 1986 | FY 1987 | FY 1988 | Future | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Module | | | | | | | | | | | |
| | BA | 1477 | 94 | 161 | 147 | 136 | 108 | 82 | - | - | 2205 |
| | BO | 1307 | 154 | 219 | 148 | 120 | 139 | 110 | 8 | - | 2205 |
| (1) West Hackberry Expansion | | | | | | | | | | | |
| Coexpansion | BA | 1 | 3 | 34 | 13 | 13 | 15 | 17 | - | - | 96 |
| | BO | | 2 | 21 | 22 | 13 | 1 | 24 | 10 | 3 | 96 |
| Deferred | BA | | | | 9 | 35 | 16 | 38 | 42 | 22 | 162 |
| | BO | | | | 2 | 25 | 27 | 43 | 39 | 26 | 162 |
| (2) Big Hill | | | | | | | | | | | |
| 100 MMB | BA | 1 | 81 | 355 | 78 | 64 | 42 | 40 | 51 | - | 712 |
| | BO | | 47 | 175 | 195 | 130 | 58 | 41 | 54 | 12 | 712 |
| 140 MMB | BA | 1 | 81 | 390 | 78 | 64 | 42 | 40 | 50 | 53 | 799 |
| | BO | | 47 | 184 | 221 | 130 | 58 | 41 | 56 | 62 | 799 |
| (3) New Solution-Mined Site | | | | | | | | | | | |
| | BA | | | 66 | 145 | 397 | 202 | 60 | 66 | 113 | 1049 |
| | BO | | | 55 | 131 | 355 | 236 | 84 | 65 | 123 | 1049 |
| (4) Cote Blanche | | | | | | | | | | | |
| | BA | | 213 | 4 | 7 | | | | | | 224 |
| | BO | | 54 | 106 | 61 | 3 | | | | | 224 |
| (5) Steel Tanks | | | | | | | | | | | |
| 40 MMB | BA | 6 | 496 | | 1 | 2 | 3 | 5 | 5 | | 518 |
| | BO | | 38 | 58 | 105 | 117 | 104 | 60 | 36 | | 518 |
| 30 MMB | BA | 6 | 29 | 388 | 1 | 2 | 3 | 4 | | | 433 |
| | BO | | 35 | 1 | 104 | 135 | 86 | 72 | | | 433 |

Table III.1 Per-Barrel Cost Analysis

| | INCREMENT | MMB | BUDGET COSTS/BBL | | | REAL COST/BBL (1981 DOLLARS) | | | PRESENT VALUE IN 1981 OF REAL COST/BBL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | FACILITIES | OIL | TOTAL | FACILITIES | OIL | TOTAL | FACILITIES | OIL | TOTAL |
| | Base Module | 580 | $ 3.80 | $43.17 | $46.97 | $3.83 | $34.54 | $38.38 | $4.10 | $29.04 | $33.15 |
| (1) | West Hackberry Expansion | | | | | | | | | | |
| | Coexpansion | 30 | $ 3.20 | $72.13 | $75.33 | $2.20 | $47.17 | $49.37 | $1.53 | $22.70 | $24.23 |
| | Deferred | 30 | $ 5.40 | $72.30 | $77.70 | $3.07 | $47.10 | $50.17 | $1.83 | $23.03 | $24.87 |
| (2) | Big Hill | | | | | | | | | | |
| | 100 MMB | 100 | $ 7.12 | $68.33 | $75.45 | $5.16 | $46.07 | $51.23 | $3.80 | $24.24 | $28.04 |
| | 140 MMB | 140 | $ 5.71 | $72.19 | $77.90 | $4.04 | $47.09 | $51.14 | $2.96 | $23.11 | $26.06 |
| (3) | New Solution-Mined Site | 120 | $ 8.74 | $76.86 | $85.60 | $5.56 | $48.36 | $53.92 | $3.63 | $21.77 | $25.40 |
| (4) | Cote Blanche | 40 | $ 5.60 | $53.52 | $59.12 | $4.62 | $41.93 | $46.55 | $3.85 | $29.90 | $33.75 |
| (5) | Steel Tanks | | | | | | | | | | |
| | 40 MMB (FY 82) | 40 | $12.95 | $62.42 | $75.38 | $8.98 | $44.43 | $53.40 | $6.35 | $26.35 | $32.70 |
| | 30 MMB (FY 83) | 30 | $14.43 | $60.37 | $74.80 | $9.90 | $43.87 | $53.77 | $6.93 | $27.10 | $34.03 |

FIGURE III 1 RANKINGS OF ALTERNATIVES BY PER BARREL COST USING ALTERNATIVE METHODS OF MEASUREMENT (#1ST IS LEAST EXPENSIVE)



increment less the present worth of salvage value of the oil. Salvage values were computed based on full project life and half-project life.[1]

The merit of this measure is that it represents the "benefit" in each year as the cumulative fill (versus the incremental) which is available at the start of that year to offset economic losses due to an oil supply cutoff. Thus, it has the attribute of being a reasonable proxy of economic benefit. On the cost side it considers total systems costs less the value of the oil (recoverable costs) at the end of project life and thus it is a closer representation of total life cycle costs.

Tables III.3 and III.4 and Figures III.3 and III.4 present the above ratio for each incremental alternative examined for five different benefit discount rates for full project life and half-project life, respectively. As with the previous ratio, costs remain discounted at 10 percent irrespective of benefit discount rates.

As expected, ratios computed on the basis of half-project life indicated more preference for faster alternatives whereas ratios computed at full project life require more discounting of benefits to justify higher cost systems.

On the basis of the values of this evaluation measure, the following conclusions can be made.

(1) West Hackberry coexpansion is preferred at lower values of benefit discounting, whereas Cote Blanche is preferred at higher value of discounting.

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[1] Project life is defined as the "backstop" year. The backstop year is that year when the real price of oil is such that alternative fuels replace petroleum. In this analysis the backstop year is 2004. (For further discussion see Section V.)

## Table III.2. Ration of Time Preference (Discount) Rate on Incremental Capacity to Present Value of Facilities Cost

| | | Present Value (81) of Facilities Costs (Millions) | | Discount Rate | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 0% | 5% | 10% | 15% | 20% |
| | Base Module | $2,378 | a[1] | 580 | 527 | 484.8 | 450.6 | 422.6 |
| | | | b[2] | .244 | .221 | .204 | .189 | .178 |
| (1) | West Hackberry Expansion | | | | | | | |
| | Coexpansion | 46 | a | 30.0 | 20.6 | 14.2 | 9.9 | 6.8 |
| | | | b | .647 | .444 | .306 | .212 | .147 |
| | Deferred | 55 | a | 30.0 | 20.8 | 14.7 | 10.5 | 7.7 |
| | | | b | .566 | .392 | .277 | .199 | .145 |
| (2) | Big Hill | | | | | | | |
| | 100 MMB | 380 | a | 100.0 | 72.0 | 52.7 | 39.1 | 29.4 |
| | | | b | .261 | .188 | .137 | .102 | .076 |
| | 140 MMB | 414 | a | 140.0 | 97.3 | 68.8 | 49.4 | 36.1 |
| | | | b | .338 | .235 | .166 | .119 | .087 |
| (3) | New Solution-Mined Site | 436 | a | 120.0 | 79.8 | 54.1 | 37.4 | 26.2 |
| | | | b | .276 | .183 | .124 | .085 | .060 |
| (4) | Cote Blanche | 154 | a | 40.0 | 33.6 | 28.6 | 24.4 | 21.0 |
| | | | b | .261 | .220 | .187 | .159 | .137 |
| (5) | Steel Tanks | | | | | | | |
| | 40 MMB (FY 82) | 254 | a | 40.0 | 30.6 | 23.8 | 18.7 | 14.9 |
| | | | b | .153 | .117 | .091 | .071 | .057 |
| | 30 MMB (FY 83) | 208 | a | 30.0 | 23.4 | 18.6 | 14.9 | 12.0 |
| | | | b | .144 | .113 | .089 | .071 | .057 |

[1] Discounted barrels (MMB)

[2] Ratio of discounted barrels to present value of facilities cost

536

FIGURE III.2: RATIO OF TIME PREFERENCE (DISCOUNT) RATE ON INCREMENTAL CAPACITY TO PRESENT VALUE OF FACILITIES COST

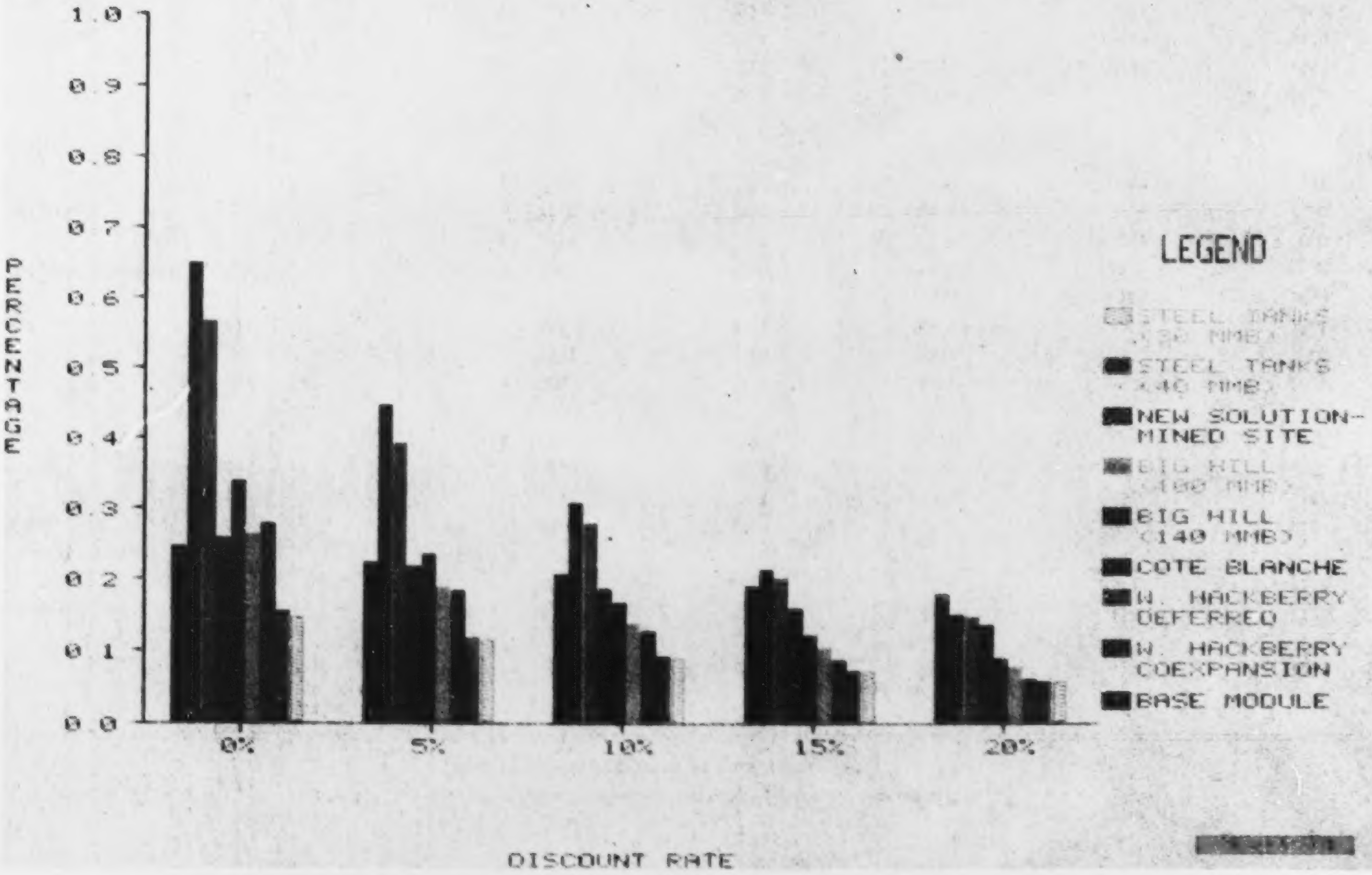


Table III.3. Ratio of Time Preference (Discount) Rate on Cumulative Capacity for Full Project Life to Present Value of Facilities and Oil Cost Less Salvage Value

| | Present Value (81) of Real Facilities and Oil Costs Less Salvage Cost (Millions) | | Discount Rate 0% | 5% | 10% | 15% | 20% |
|---|---|---|---|---|---|---|---|
| Base Module | 13,823 | a[1] | 12,150.0 | 6763.6 | 4199.9 | 2848.5 | 2069.1 |
| | | b[2] | .879 | .489 | .504 | .206 | .150 |
| (1) West Hackberry | | | | | | | |
| Coexpansion | 477 | a | 462.0 | 216.6 | 108.7 | 57.6 | 31.8 |
| | | b | .986 | .454 | .228 | .120 | .066 |
| Deferred | 495 | a | 465.0 | 220.9 | 113.5 | 62.3 | 36.2 |
| | | b | .938 | .445 | .229 | .125 | .073 |
| (2) Big Hill | | | | | | | |
| 100 MMB | 1975 | a | 1626.0 | 788.7 | 414.9 | 233.7 | 139.3 |
| | | b | .823 | .399 | .210 | .118 | .070 |
| 140 MMB | 2483 | b | 2173.0 | 1033.4 | 531.4 | 2921 | 169.8 |
| | | b | .875 | .416 | .214 | .117 | .068 |
| (3) New Solution-Mined Site | 2134 | a | 1754.0 | 813.9 | 406.9 | 216.9 | 122.1 |
| | | b | .822 | .381 | .191 | .102 | .057 |
| (4) Cote Blanche | 1110 | a | 778.0 | 412.5 | 240.8 | 152.0 | 102.1 |
| | | b | .700 | .372 | .217 | .137 | .092 |
| (5) Steel Tanks | | | | | | | |
| 40 MMB (FY 82) | 981 | a | 700.0 | 352.0 | 193.3 | 114.2 | 71.6 |
| | | b | .713 | .358 | .196 | .116 | .072 |
| 30 MMB (FY 83) | 770 | a | 538.0 | 273.6 | 152.1 | 91.1 | 57.9 |
| | | b | .698 | .355 | .197 | .118 | .075 |

[1] Discounted Barrel years

[2] Ratio of discounted barrel-years to present value of costs less salvage

Table III.4. Ratio of Time Preference (Discount) Rate on Cumulative Capacity for Half-Project Life to Present Value of Facilities and Oil Cost Less Salvage Value

| | Present Value (81) of Real Facilities and Oil Costs Less Salvage Cost (Millions) | | Discount Rate | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0% | 5% | 10% | 15% | 20% |
| Base Module | 8,028 | a[1] | 5153.0 | 3728.2 | 2790.5 | 2152.8 | 1705.9 |
| | | b[2] | .679 | .464 | .348 | .268 | .212 |
| (1) West Hackberry | | | | | | | |
| Coexpansion | 177 | a[1] | 102.0 | 61.1 | 37.1 | 22.7 | 13.9 |
| | | b[2] | .575 | .345 | .209 | .128 | .078 |
| Deferred | 196 | a[1] | 105.0 | 65.5 | 41.8 | 27.3 | 18.2 |
| | | b[2] | .536 | .334 | .213 | .139 | .093 |
| (2) Big Hill | | | | | | | |
| 100 MMB | 975 | a[1] | 426.0 | 270.5 | 176.1 | 117.2 | 79.6 |
| | | b[2] | .436 | .277 | .180 | .120 | .081 |
| 140 MMB | 1084 | a[1] | 493.0 | 307.9 | 197.1 | 129.0 | 86.2 |
| | | b[2] | .454 | .283 | .181 | .118 | .079 |
| (3) New Solution-Mined Site | 886 | a[1] | 314.0 | 192.0 | 120.3 | 77.1 | 50.4 |
| | | b[2] | .354 | .217 | .136 | .087 | .057 |
| (4) Cote Blanche | 674 | a[1] | 298.0 | 205.2 | 145.3 | 105.4 | 78.2 |
| | | b[2] | .442 | .304 | .216 | .156 | .116 |
| (5) Steel Tanks | | | | | | | |
| 40 MMB (FY 82) | 582 | a[1] | 220.0 | 144.7 | 97.7 | 67.6 | 47.7 |
| | | b[2] | .378 | .248 | .168 | .116 | .082 |
| 30 MMB (FY 83) | 471 | b[2] | 178.0 | 118.1 | 80.5 | 56.1 | 40.0 |
| | | b[2] | .378 | .251 | .170 | .119 | .084 |

[1] Discounted barrel years

[2] Ratio of discount barrel-years to present value of costs less salvage

FIGURE III 3 RATIO OF TIME PREFERENCE (DISCOUNT) RATE ON CUMULATIVE CAPACITY FOR FULL PROJECT LIFE TO PRESENT VALUE OF FACILITIES AND OIL LESS SALVAGE VALUE

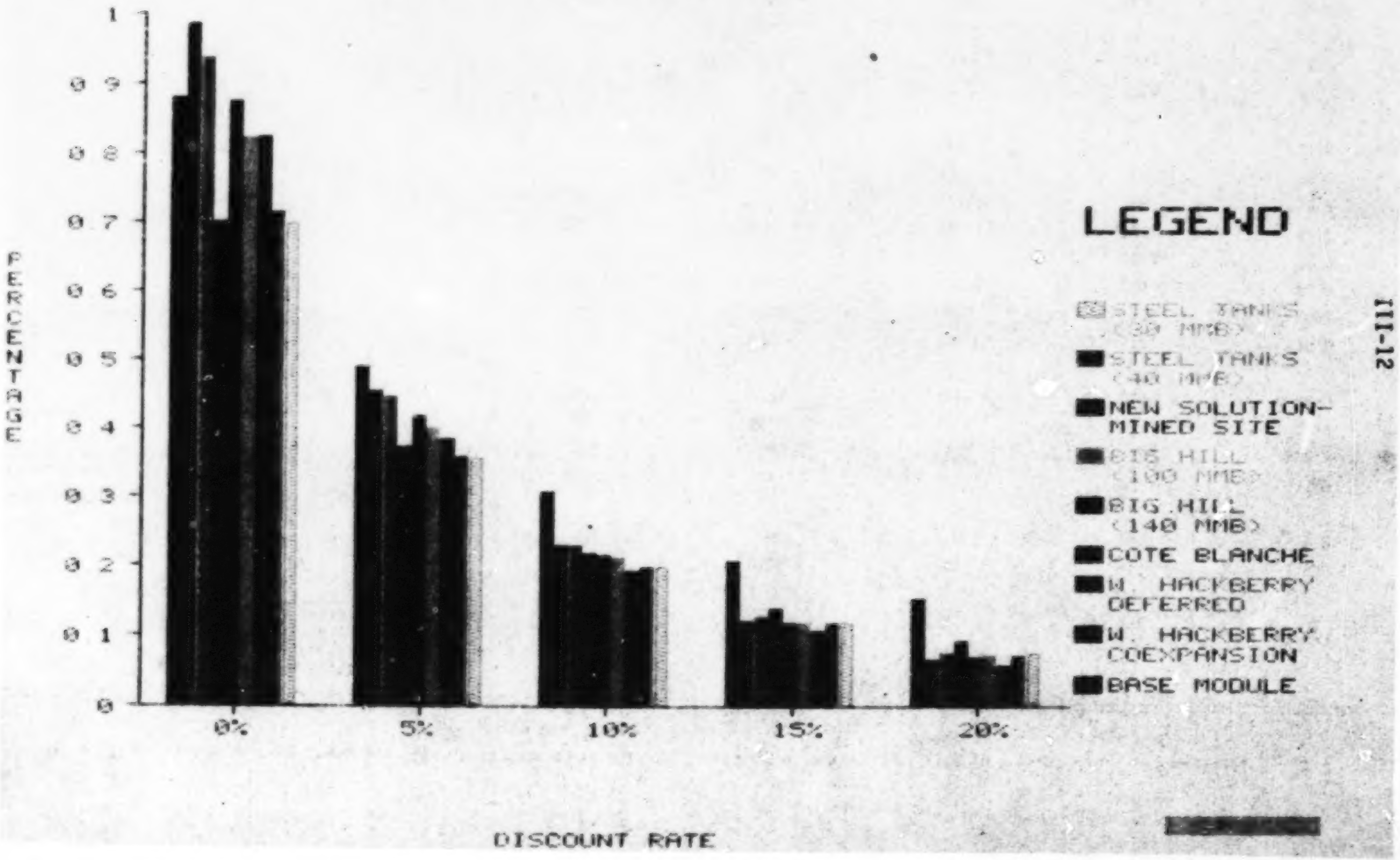
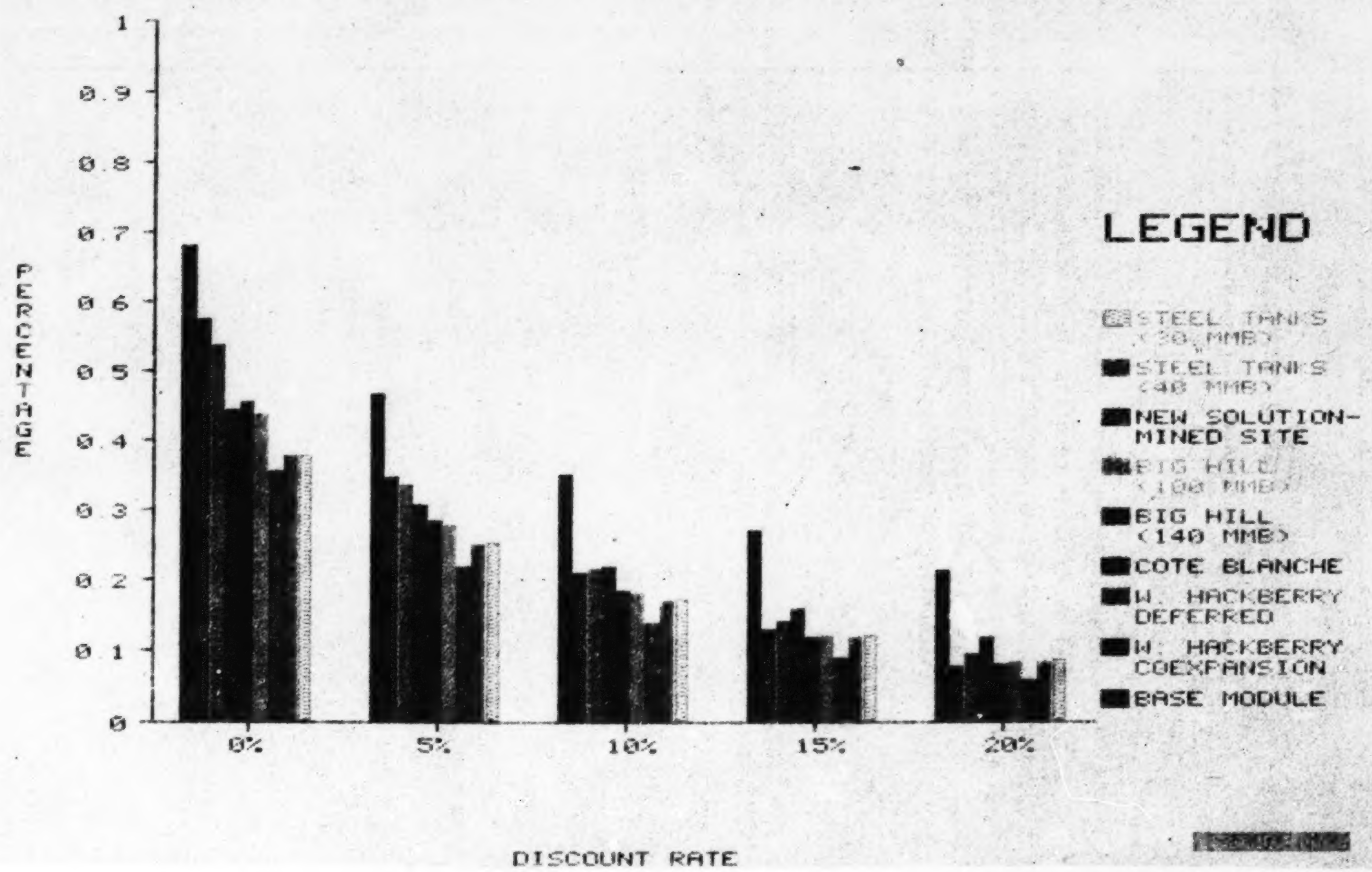


FIGURE III.4: RATIO OF TIME PREFERENCE (DISCOUNT) RATE ON CUMULATIVE CAPACITY FOR HALF-PROJECT LIFE TO PRESENT VALUE OF FACILITIES AND OIL LESS SALVAGE VALUE.



54[redacted]

(2) Steel tanks are less cost-effective than any other alternative except for high rates of discounting benefits if the entire project life is considered. They are only marginally preferred in the near term over a new 120 MMB salt dome site.

(3) Cote Blanche is more cost-effective than both versions of Big Hill except when benefits are discounted at a low rate over the full project life.

(4) Big Hill 140 is preferred over Big Hill 100 except for high discounting of benefits.

## SECTION IV

## DESCRIPTION OF SPR SYSTEM ALTERNATIVES

Based on the rank evaluation in Section III, we have drawn the following conclusions:

(1) That the composition of the 750 MMB program in the FY 1982 budget --the Base Module (580 MMB) plus the 30 MMB coexpansion of West Hackberry plus the development of 140 MMB in capacity at Big Hill --is the preferred composition if SPR development is to terminate at 750 MMB. The West Hackberry and Big Hill increments rank consistently high using wide range of alternative criteria. Specifically, these increments rank above all others except Cote Blanche for the following criteria.

- Minimization of the unit cost of facilities in nominal dollars, real dollars, and the present value of real dollars.
- Minimization of real dollar program (oil plus facilities) costs per barrel.
- Ratio of discounted facility capacity increments to present value of facilities costs, for all discount rates.
- Ratios of discounted barrel-years of protection to total program investment value (present value of facilities and oil costs net of salvage value) up to and including benefit discount rates of 10 percent per year.

(2) Under most circumstances, Cote Blanche is the most attractive competition to the current 750 MMB program composition. It should have priority in any decision to go beyond 750 MMB total system size. In some measures, it is preferred to some portions of the current configuration but such preference is sensitive to

estimates of the ultimate storage capacity of the Cote Blanche mine. For example, on Tables III.2 and III.3, Cote Blanche appears preferable to Big Hill 140 at a 10 percent benefit discount ratio, but a 10 percent reduction in the 40 MMB estimated Cote Blanche capacity would make the preference for these two projects equivalent. Yet, no such 10 percent reduction in capacity would render Cote Blanche less attractive than steel tanks.

(3) A new solution-mined site, while less attractive than Cote Blanche, could be more or less attractive than steel tanks, depending on one's time preference (discount) rate and on project duration. Solution mining is slower but cheaper and could be preferable if one's concern is with facilities costs and not with schedule. A continuation of the program to the end of this century makes a new solution-mined site attractive relative to steel tanks, but if one's only concern is with the current decade, steel tanks make more sense.

Based on these general findings, we have developed the following SPR System alternatives for consideration:

SYSTEM #1 750 MMB SYSTEM (FY 1983)

This system consists of the 580 MMB Base Module, the West Hackberry coexpansion and the Big Hill site developed to 140 MMB. The configuration is thus the same as the FY 1982 budget plan, but the schedule is different because of the acceleration of Bryan Mound leaching. Table IV.1 presents the buildup of the oil fill schedule for this system.

Assuming that the SPR is filled to capacity (267 MMB) at the end of FY 1982, the following (refer to Table IV.2) are the fill levels for future years expressed as total annual fill and average daily fill rates.

Table IV.1. 750 MMB System (1983)
Oil Fill Capability
(Cumulative MMB, end of fiscal year)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|
| Base Module | 251 | 267 | 343 | 417 | 467 | 563 | 580 | 580 | 580 |
| West Hackberry Coexpansion | 0 | 0 | 0 | 0 | -11 | -25 | +18 | 30 | 30 |
| Big Hill 140 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 60 | 140 |
| 750 MMB System | 251 | 267 | 343 | 417 | 456 | 538 | 611 | 670 | 750 |
| FY 1982 Budget | 248 | 261 | 331 | 398 | 409 | 481 | 605 | 687 | 750 |
| Change | +3 | +6 | +12 | +19 | +47 | +57 | +6 | -17 | 0 |

Table IV.2. 750 System (1983)
Annual Oil Fill Levels

| Fiscal Year | Annual Total (MMB) | Average Daily Rate MBD |
|---|---|---|
| 1983 | 76 | 208 |
| 1984 | 74 | 203 |
| 1985 | 39 | 107 |
| 1986 | 82 | 225 |
| 1987 | 73 | 200 |
| 1988 | 59 | 162 |
| 1989 | 80 | 219 |
| Average | 69 | 189 |

In no year would fill equal or even approach 300 MBD unless a substantial underfill had occurred in the prior year. If in one of the seven fiscal years, fill were constrained to about 100 MBD (37 MMB/year), the Energy Security Act minimum, then an average rate of fill of 200 MBD would be achieved in the other six fiscal years.

## SYSTEM #2. 790 MMB SYSTEM

This system consists of the 750 MMB System (System #1) plus the addition of the Cote Blanche site at 40 MMB. Table IV.3 presents the oil fill capability for this system.

Table IV.3. 790 MMB System
Oil Fill Capability
(Cumulative MMB, End of Fiscal Year)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|
| 750 MMB System (1983) | 251 | 267 | 343 | 417 | 456 | 538 | 611 | 670 | 750 |
| Cote Blanche | 0 | 0 | 0 | 18 | 40 | 40 | 40 | 40 | 40 |
| 790 MMB System | 251 | 267 | 343 | 435 | 496 | 578 | 651 | 710 | 790 |
| Annual Fill (MMB) | | | 76 | 92 | 61 | 82 | 73 | 59 | 80 |
| Average Daily Fill (MBD) | | | 208 | 252 | 167 | 225 | 200 | 162 | 219 |

The average annual fill for the FY 1983- 1989 period increases to almost 75 MMB/year (205 MBD) for the 790 MMB system in comparison to the 750 MMB alternative.

Two years would be filled at less than 200 MMD (1986 and 1988) unless a prior year had been underfilled. If oil fill were constrained to 100 MBD in one of the years, an average fill rate of 222 MBD could be achieved in the remaining six years.

As noted in Section II, the Cote Blanche increment assumes FY 1982 funding of over $200 million from a budget amendment. If this funding were obtained from an FY 1982 supplemental, available in the Spring of 1982, then a 6-month delay would ensue, slipping the entire 40 MMB in fill into FY 1985. A full year delay in funding until FY 1983 would result in a full year delay in the fill capability schedule.

## SYSTEM #3. 890 MMB SYSTEM

This system consists of the 790 MMB system described above plus a further 100 MMB in steel tank development: one 40 MMB site funded in FY 1982 plus two further sites, each 30 MMB, funded in FY 1983. Table IV.4 presents the fill capability for this system.

Table IV.4. 890 MMB System
Oil Fill Capability
(Cumulative MMB, End of Fiscal Year)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|
| 790 MMB System | 251 | 267 | 343 | 435 | 496 | 578 | 651 | 710 | 790 |
| 40 MMB Steel Tanks | 0 | 0 | 0 | 0 | 8 | 20 | 32 | 40 | 40 |
| 60 MMB Steel Tanks | 0 | 0 | 0 | 0 | 16 | 40 | 60 | 60 | 60 |
| Total, 890 MMB System | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 |
| Annual Fill (MMB) | | | 76 | 92 | 85 | 118 | 105 | 67 | 80 |
| Fill Rate (MBD) | | | 208 | 252 | 233 | 323 | 288 | 184 | 219 |

The average fill rate for the FY 1983 - 1980 period would be 244 MBD, increasing to 268 MBD for six years if fill were constrained to 100 MBD for one year.

## SYSTEM #4. 1000 MMB SYSTEM - MIXED

This system consists of the 890 MMB System (#3) which includes 100 MMB in steel tanks, plus the addition of a 120 MMB solution-mined site filled to 110 MMB. Table IV.5 outlines the capacity schedule associated with this option.

Table IV.5. 1000 MMB System - Mixed
Oil Fill Capability
(Cululative MMB, End of Fiscal Year)

| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | |
|---|---|---|---|---|---|---|---|---|---|
| 890 MMB System | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 | 890 |
| One Solution-mined Site | --- | --- | --- | --- | --- | --- | 14 | 60 | 110 |
| 1000 MMB System-Mixed | 267 | 343 | 435 | 520 | 638 | 743 | 824 | 950 | 1000 |
| Annual Fill (MMB) | | 76 | 92 | 85 | 118 | 105 | 81 | 126 | 50 |
| Fill Rate (MMB) | | 208 | 252 | 233 | 323 | 288 | 222 | 345 | 137 |

In comparison to exclusive reliance on steel tanks for the 790 - 1000 MMB increment (System #5), this system defers the high "spike" year of annual fill from 1987 to 1989 and solves the qualitative problem of the marginal difficulties in locating additional steel tank sites.

SYSTEM #5. 1000 MMB SYSTEM -STEEL TANKS ONLY

This system would emphasize schedule over cost, entailing the 890 MMB system described above plus a further 110 MMB in steel tanks, funded in FY 1984. Thus the overall system would include a total of 210 MMB in steel tanks. Table IV.6 presents the fill capability for this system.

Table IV.6. 1000 MMB System - Steel Tanks Only

Oil Fill Capability

(Cumulative MMB, end of fiscal year)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|
| 890 MMB System | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 |
| 110 MMB Steel Tanks | 0 | 0 | 0 | 0 | 0 | 24 | 60 | 94 | 110 |
| 1000 MMB System-Steel Tanks Only | 251 | 267 | 343 | 435 | 520 | 662 | 803 | 904 | 1000 |
| Annual Fill (MMB) | | | 76 | 92 | 85 | 142 | 141 | 101 | 96 |
| Avg. Daily Fill (MBD) | | | 208 | 252 | 233 | 389 | 387 | 277 | 263 |

This system permits average annual fill of 105 MMB (287 MBD) over the 1983 - 1989 period, or 116 MMB (318 MBD) for six years if fill is constrained to 100 MBD in one year. With a projected oil price of nearly $65/bbl in 1987, annual oil costs would peak in that year at $9.5 billion, considerably more than the current budget level.

One factor which may not be adequately treated in this system proposal is the potential problem associated with identifying six sites for very large steel tank development. While there is no current empirical basis for analyzing this phenomenon, one could project that from the standpoint of both economics and environmental and community aspects, each successive steel tank site will be marginally more difficult to identify and secure for SPR use. Also, each successive steel tank development project would have marginally greater impact on the capacity utilization in the steel tank fabrication industry. While we understand that unused productive capacity exists, it is reasonable to expect that the development of 210 MMB in steel tanks would have disproportionate effects on the industry in relation to a 100 MMB steel tank system.

One other factor not adequately treated here is the environmental problems of steel tanks which may require the government to acquire "offsets" (reduction in pollution from other sources) which may add costs and delay completion of the tank farms.

Table IV.7 summarizes the oil fill capability schedules for all alternatives and Table IV.8 summarizes annual fill rates for all systems alternatives.

In considering alternative methods of financing the SPR, the Congress is contemplating setting an annual average daily fill target of 300 MBD (S.918, HR 3808) or 230 MBD (S.1343). These fill levels translate into the cumulative fill requirements after 1982 noted on the bottom of Table IV.8, assuming the SPR is filled to capacity in these years.

None of the systems can meet either of these requirements in FY 1983 and there is no known construction method which could solve this shortfall. The 790 MMB System (B) could meet the 230 MBD criterion during the 1984-1986 period and, through the use of at least 100 MMB in steel tanks, this criterion could be met for all years after 1983.

The 300 MBD criterion is essentially unachievable by all systems alternatives.

## Program Costs

Section III illustrated the variety of methods by which program cost information can be portrayed. The appendix contains the detailed information on the costs for each increment and each total system. Table IV.8 contains a summary of SPR system alternatives and Table IV.9 presents a summary of the oil and facilities costs for each system alternative, expressed in Table IV.10 on a per-barrel basis. Table IV.11 presents the near-term (FY 1982-1984) budget authority and outlay requirements for each system.

## Table IV.7. Summary of SPR System Alternatives Oil Fill Capability Schedules

(Cumulative MMB, End of Fiscal Year)

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| #1. 750 MMB(1983) | 251 | 267 | 343 | 417 | 456 | 538 | 611 | 670 | 750 | 750 |
| #2. 790 MMB | 251 | 267 | 343 | 435 | 496 | 578 | 651 | 710 | 790 | 790 |
| #3. 890 MMB | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 | 890 |
| #4. 1000 MMB-Mixed | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 824 | 950 | 1000 |
| #5. 1000 MMB-Steel tanks | 251 | 267 | 343 | 435 | 520 | 662 | 803 | 904 | 1000 | 1000 |
| 230 MBD | | | 351 | 435 | 519 | 603 | 687 | 750 | | |
| 300 MBD | | | 377 | 486 | 596 | 705 | 750 | | | |

Table IV.8. Summary of SPR System Alternatives
Annual and Average Daily Oil Fill Rates

(Annual Fill in MMB, Average Daily Fill in MBD )

Fiscal Year

| | | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|
| #1. 750 MMB (1983) | MMB/YR | 76 | 74 | 39 | 82 | 73 | 59 | 80 | 0 |
| | MBD | 208 | 203 | 107 | 225 | 200 | 162 | 219 | 0 |
| #2. 790 MMB | MMB/YR | 76 | 92 | 61 | 82 | 73 | 59 | 80 | 0 |
| | MBD | 208 | 252 | 167 | 225 | 200 | 162 | 219 | 0 |
| #3. 890 MMB | MMB/YR | 76 | 92 | 85 | 118 | 105 | 67 | 80 | 0 |
| | MBD | 208 | 252 | 233 | 323 | 288 | 184 | 219 | 0 |
| #4. 1000 MMB-Mixed | MMB/YR | 76 | 92 | 85 | 118 | 105 | 81 | 126 | 50 |
| | MBD | 208 | 252 | 233 | 323 | 288 | 222 | 345 | 137 |
| #5. 1000 MMB Steel Tanks | MMB/YR | 76 | 92 | 85 | 142 | 141 | 101 | 96 | 0 |
| | MBD | 208 | 252 | 233 | 389 | 387 | 277 | 263 | 0 |

## SECTION V

## ECONOMIC COST ANALYSIS OF ALTERNATIVE SPR SYSTEMS

This section presents the results of a benefit-cost analysis of the economic value of several alternative configurations for the Strategic Petroleum Reserve (SPR). These SPR alternatives--defined and discussed in the previous chapter--include five systems, 750 MMB, 790 MMB, 890 MMB, and two 1,000 MMB sizes.

The economic concept employed in this analysis to develop a benefit-cost measure is based on the idea of social surplus loss. Here, a given SPR system is evaluated with respect to its ability to reduce the social surplus loss associated with a disruption to the nation's supply of oil. At its simplist, the social surplus concept evaluates the increased cost of oil faced by consumers multiplied by the quantity consumed. It negatively affects consumers of oil who continue to buy at higher prices; and it also negatively affects those who are forced to forego consumption. On the other hand, it positively affects the domestic producers of oil who obtain more revenue due to the price increase stemming from the supply shortfall.[1]

The particular methodological formulation of the social surplus loss approach followed here is based on the utilization of a multi-period stochastic dynamic programming model produced for the Office of Policy and Analysis of this agency by Dr. Tom Teisberg in 1977.

Although the Teisberg model does indeed offer an objective and fairly realistic method of approaching the evaluation of a given SPR alternative system, this model--like most such models--is intrinsically dependent on the exogeneous selection of a specific set of economic assumptions. In sum, these assumptions relate to the future character of the world oil market and also to the likelihood of a world oil shortfall. Changing these assumptions necessarily and directly affects the output of the Teisberg model.

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[1] There are, in fact, other types of analyses which might be carried out to estimate the economic benefit of a given SPR system. One such, based on the concept of gross national product loss averted, attempts to calculate some roughly analogous figure that is at once less precise and more comprehensive in its formulation.

Aside from this dependency on important assumptions, the Teisberg model (in the present formulation used here) tends to be somewhat insensitive to small differences in the fill capacity schedule of alternative SPR systems. Data input procedures call for rounding the SPR capacity to the nearest 50 MMB. The practical effect is to sometimes understate and other times overstate the given SPR system's benefit by magnitudes of up to 50 million barrels. Table V.1 shows the comparison of actual fill capacity schedules for each of the five SPR options analyzed in this report to indexes of fill capacity schedules used by the model, illustrating the effects of this procedure.

The basic element of the Teisberg model is an oil market "insecurity cost function." This function depends primarily on the nature of the world oil market that would be faced by a given SPR program over its operational life. In this analysis, world oil markets are represented by three characteristics "states":

(1) a "slack" market, wherein SPR oil purchases would take place without any impact on the world oil market in general;

(2) a "tight" market, wherein SPR oil acquisitions would raise the world oil price at a rate of $1.50/bbl. for each 500 thousand barrels per day. This would have the effect of increasing the oil price about 60 cents per barrel at current SPR oil fill levels of 200 thousand barrels per day; and

(3) an oil market supply disruption "state" that assumes an OPEC delivery cutback amounting to about 12 million barrels per day, or 40 percent of OPEC's current total output.

Markov chain probability transition matrices are used to manipulate statistical assumptions about the likelihood of encountering each of these market states each year. This analysis evaluates the significance of a wide range of assumptions regarding encountering such an oil supply disruption as described in (3), ranging from 0 percent yearly to 20 percent yearly.

It should be remembered, however, that these seemingly modest assumptions about likelihood of yearly disruption translate into far higher values when considered in terms of the probability of experiencing at least one such disruption over the lifespan of the project. For example, a 5 percent likelihood of yearly disruption implies a 71 percent likelihood of at least one such disruption over a 24-year project lifespan.

## OTHER ESSENTIAL ASSUMPTIONS

Several other important assumptions are made in the implementation of the Teisberg model. The world oil price path is assumed to begin at $34 per barrel in 1981, rising by 3 percent per year until it reaches a "backstop" price of $75 per barrel in year 2004. In that year, imported oil is assumed to be no longer essential for the nation's economic well-being, and therefore the SPR oil can be sold off and the project discontinued.

The primary costs of the SPR are the costs of purchasing or acquiring the oil, plus the holding costs. Of course,the cost of acquiring the oil is the market price at the time the oil is purchased plus the transportation cost when it is delivered. The holding cost, on the other hand, has two components;

(1) the cost of building and maintaining the storage facilities;

(2) the opportunity or capital cost of holding onto a valuable commodity. A discount rate of 10 percent is used to represent the return that could be received from the next most comparable investment.

## OPTIMIZATION RESULTS

Table V.2 presents the results of the Teisberg model evaluation of the five alternative hypothetical systems considered in this analysis.

Table V.1. Illustration of the Translation Procedure Employed to Introduce Values for the Fill Capacity Schedule of Each Alternative SPR Hypothetical Option to the Teisberg Model

| | SPR Options: Fill Capacity Schedule (MMB) | | | | |
|---|---|---|---|---|---|
| Year | 750 | 790 | 890 | 1,000 | 1,000 |
| 1981 | 251 | 251 | 251 | 251 | 251 |
| 1982 | 267 | 267 | 267 | 267 | 267 |
| 1983 | 343 | 343 | 343 | 343 | 343 |
| 1984 | 417 | 435 | 435 | 435 | 435 |
| 1985 | 456 | 496 | 520 | 496 | 523 |
| 1986 | 538 | 578 | 638 | 578 | 668 |
| 1987 | 610 | 650 | 742 | 650 | 808 |
| 1988 | 670 | 710 | 810 | 738 | 898 |
| 1989 | 750 | 790 | 890 | 910 | 1,000 |
| 1990 | 750 | 790 | 890 | 1,000 | 1,000 |
| | SPR Options: Fill Capacity Model Schedule Translation (Index) | | | | |
| 1981 | 6 | 6 | 6 | 6 | 6 |
| 1982 | 6 | 6 | 6 | 6 | 6 |
| 1983 | 8 | 8 | 8 | 8 | 8 |
| 1984 | 9 | 10 | 10 | 10 | 10 |
| 1985 | 10 | 11 | 11 | 11 | 11 |
| 1986 | 12 | 13 | 14 | 13 | 14 |
| 1987 | 13 | 14 | 16 | 14 | 17 |
| 1988 | 14 | 15 | 17 | 16 | 19 |
| 1989 | 16 | 17 | 19 | 19 | 21 |
| 1990 | 16 | 17 | 19 | 21 | 21 |

As is indicated, the net economic benefit (expressed as consumer surplus loss avoided) of all of the five alternatives is negative in the instance where the likelihood of shortfall is zero. However, it rises quickly into a positive value for each of the alternatives at the 1 percent mark for pobability of shortfall escalating upward to over $323 billion under the asumption of a 20 percent annual probability of shortfall in the instance o the second billion barrel SPR alternative. In each case, there is a psitive correlation between likelihood of shortfall and consumer surplus lss avoided.

Tble V.3 presents these same results in terms of an ordinal ranking. It sggests a systematic shift of optimality from the smaller to the larger of te alternatives as the probability of a shortfall is assumed to advance. I the instance of a very small likelihood of shortfall, the 750 MMB system poves out to be the optimal system. However, by the time that the pobability is scaled upwards to 4 percent, the 750 MMB system is shown to b relegated to last place in terms of optimality.

Table V.2. Results of Teisberg Model Analysis:
Net Expected Economic Benefits[2] ($billion)

| Assumed Probability of Shortfall | | SYSTEM | | | | |
|---|---|---|---|---|---|---|
| Yearly | Project Life[1] | (1) 750 | (2) 790 | (3) 890 | (4) 1,000 | (5) 1,000 |
| | | (tight market condition) | | | | |
| 0.0 | 0.0 | -6.7 | -6.8 | -7.3 | -7.7 | -8.0 |
| 1.0 | .21 | 5.53 | 5.38 | 4.87 | 4.51 | 4.15 |
| 2.0 | .38 | 20.72 | 20.68 | 20.17 | 19.81 | 19.45 |
| 3.0 | .48 | 40.79 | 41.24 | 41.31 | 41.01 | 40.72 |
| 4.0 | .62 | 60.34 | 61.43 | 62.15 | 63.04 | 62.82 |
| 5.0 | .71 | 79.18 | 80.85 | 82.88 | 83.72 | 83.73 |
| 10.0 | .92 | 162.92 | 166.89 | 172.26 | 175.20 | 175.75 |
| 15.0 | .98 | 230.12 | 241.85 | 242.87 | 246.77 | 247.60 |
| 20.0 | .99+ | 283.16 | 298.67 | 297.22 | 301.72 | 302.65 |
| | | (slack market condition) | | | | |
| 5.0 | .71 | 90.18 | 92.74 | 96.22 | 98.42 | 98.68 |
| 10.0 | .92 | 176.81 | 181.74 | 188.68 | 192.83 | 193.63 |
| 15.0 | .98 | 246.49 | 252.80 | 261.27 | 266.29 | 267.45 |
| 20.0 | .99+ | 301.03 | 307.98 | 316.80 | 322.21 | 323.37 |

[1] Expresses the statistical chance of encountering at least one such oil supply shortfall over the project life of 24 years running from 1981 to 2004 inclusive.

[2] Represents expected consumer surplus loss avoided based on SPR oil transactions less costs of SPR storage facilities.

Table V.3. Rank Ordering of the Results of the Teisberg Model Analysis According to Size of Consumer Surplus Loss Avoided

| Assumed Probability of Shortfall | | SYSTEM | | | | |
|---|---|---|---|---|---|---|
| Yearly | Project Life[1] | (1) 750 | (2) 790 | (3) 890 | (4) 1,000 | (5) 1,000 |
| | | (tight market condition) | | | | |
| 0.0. . | .0.0 | N/A | N/A | N/A | N/A | N/A |
| 1.0. . | .21 | 1 | 2 | 3 | 4 | 5 |
| 2.0. . | .38 | 1 | 2 | 3 | 4 | 5 |
| 3.0. . | .48 | 4 | 2 | 1 | 3 | 5 |
| 4.0. . | .62 | 5 | 4 | 3 | 1 | 2 |
| 5.0. . | .71 | 5 | 4 | 3 | 2 | 1 |
| 10.0. . | .92 | 5 | 4 | 3 | 2 | 1 |
| 15.0. . | .98 | 5 | 4 | 3 | 2 | 1 |
| 20.0. . | .99+ | 5 | 4 | 3 | 2 | 1 |
| | | (slack market condition) | | | | |
| 5.0. . | .71 | 5 | 4 | 3 | 2 | 1 |
| 10.0. . | .92 | 5 | 4 | 3 | 2 | 1 |
| 15.0. . | .98 | 5 | 4 | 3 | 2 | 1 |
| 20.0. . | .99+ | 5 | 4 | 3 | 2 | 1 |

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[1] Expresses the statistical chance of encountering at least one such oil supply shortfall over the project life of 24 years running from 1981 to 2004 inclusive.

## APPENDIX A: DETAILED DATA
## BASE MODULE ALTERNATIVE INCREMENTS TO BASE MODULE BASELINE SYSTEM ALTERNATIVE SYSTEMS

This appendix presents costs, fill capability and fill data for the Base Module and alternative increments to that module for achieving a 750 MMB System (Tables A-1 through A-9). Additionally, it presents fully detailed budget requirements for achieving the 750 MMB Baseline System and alternative larger systems of 790 MMB, 890 MMB and 1,000 MMB, respectively (Tables A-11 through A-14).

The individual tables are identified as follows:

A-1 PROJECT DATA SHEET - BASE MODULE
A-2 PROJECT DATA SHEET - WEST HACKBERRY 30 MMB COEXPANSION
A-3 PROJECT DATA SHEET - WEST HACKBERRY 30 MMB DEFERRED
A-4 PROJECT DATA SHEET - BIG HILL 100 MMB
A-5 PROJECT DATA SHEET - BIG HILL 140 MMB
A-6 PROJECT DATA SHEET - NEW 120 MMB SOLUTION-MINED SITE
A-7 PROJECT DATA SHEET - COTE BLANCHE 40 MMB
A-8 PROJECT DATA SHEET - STEEL TANKS 40 MMB
A-9 PROJECT DATA SHEET - STEEL TANKS 30 MMB
A-10 BUDGET AUTHORITY REQUIREMENTS - 750 MMB BASELINE SYSTEM
A-11 BUDGET AUTHORITY REQUIREMENTS - 790 MMB UNDERGROUND SYSTEM
A-12 BUDGET AUTHORITY REQUIREMENTS - 890 MMB MIXED SYSTEM
A-13 BUDGET AUTHORITY REQUIREMENTS - 1,000 MMB MIXED SYSTEM
A-14 BUDGET AUTHORITY REQUIREMENTS - 1,000 MMB STEEL TANKS SYSTEM

## Table IV.9. Funding Requirements for Alternative Systems
(In Millions)

| | | NOMINAL DOLLARS | | | REAL 1981 DOLLARS | | |
|---|---|---|---|---|---|---|---|
| SYSTEM | MMB | FACILITIES | OIL | TOTAL | FACILITIES | OIL | TOTAL |
| #1 | 750 | $ 3,100 | $37,406 | $40,506 | $2,853 | $28,041 | $30,894 |
| #2 | 790 | $ 3,324 | $39,547 | $42,871 | $3,038 | $29,718 | $32,756 |
| #3 | 890 | $ 4,708 | $45,666 | $50,374 | $3,991 | $34,127 | $38,118 |
| #4 | 1000 | $ 5,757 | $54,089 | $59,846 | $4,658 | $39,438 | $44,096 |
| #5 | 1000 | $ 6,177 | $52,995 | $59,172 | $4,913 | $39,142 | $44,055 |

Table IV.10. Per-Barrel Costs for Alternative Systems

| | NOMINAL DOLLARS | | | REAL 1981 DOLLARS | | |
|---|---|---|---|---|---|---|
| SYSTEM | FACILITIES | OIL | TOTAL | FACILITIES | OIL | TOTAL |
| #1 | $4.13 | $49.87 | $54.00 | $3.80 | $37.39 | $41.19 |
| #2 | $4.21 | $50.06 | $54.27 | $3.84 | $37.62 | $41.46 |
| #3 | $5.29 | $51.31 | $56.60 | $4.48 | $38.34 | $42.83 |
| #4 | $5.76 | $54.10 | $59.86 | $4.66 | $39.44 | $44.10 |
| #5 | $6.18 | $53.00 | $59.17 | $4.91 | $39.14 | $44.06 |

### Table IV.11. Near-Term Budget Requirements for Alternative Systems (In Millions)

| SYSTEM[1] | FY 1982 | | FY 1983 | | FY 1984 | |
|---|---|---|---|---|---|---|
| | BA | BO | BA | BO | BA | BO |
| #1 | $3,883 | $3,625 | $4,933 | $3,845 | $3,183 | $4,429 |
| #2 | $4,097 | $3,680 | $4,939 | $3,952 | $5,332 | $5,105 |
| #3 | $4,654 | $3,791 | $5,716 | $4,013 | $6,001 | $5,418 |
| #4 | $4,658 | $3,795 | $5,785 | $4,071 | $6,149 | $5,552 |
| #5 | $4,676 | $3,795 | $5,834 | $4,127 | $7.298 | $5,538 |

[1] Includes planning and program direction costs.

## TABLE A-1

## PROJECT DATA SHEET

## 580 MMB BASE MODULE

| | | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | | | | | |
| Phase I | | | | | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | | | | | |
| | BA | 300 | 382 | 174 | - | - | - | | | | | | | | 856 |
| | BO | 51 | 318 | 374 | 29 | 59 | 25 | | | | | | | | 856 |
| Phase II | | | | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | | | | | | | | |
| | BA | | 65 | 422 | - | 40 | 34 | 49 | 63 | 21 | 8 | - | | | 702 |
| | BO | | 3 | 80 | 173 | 160 | 80 | 92 | 52 | 40 | 17 | 5 | | | 702 |
| Phase III - Bryan Mound | | | | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | | | | | | | | |
| | BA | | | | | 1 | 19 | 25 | 6 | 37 | 19 | 10 | - | - | 117 |
| | BO | | | | | 1 | 12 | 30 | 6 | 15 | 35 | 18 | - | - | 117 |
| Non Phase Specific[1] | | | | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | | | | | | | | |
| | BA | | 17 | 36 | - | 40 | 41 | 87 | 78 | 78 | 81 | 72 | - | | 530 |
| | BO | | | 6 | 19 | 34 | 37 | 97 | 90 | 65 | 87 | 87 | 8 | | 530 |
| Total Facilities | | | | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | | | | | | | | |
| | BA | 300 | 464 | 632 | - | 81 | 94 | 161 | 147 | 136 | 108 | 82 | - | | 2205 |
| | BO | 51 | 321 | 460 | 221 | 254 | 154 | 219 | 148 | 120 | 139 | 110 | 8 | | 2205 |
| Real (1981) Dollars | | | | | 1302[2] | 254 | 140 | 181 | 111 | 81 | 86 | 62 | 4 | | 2226 |
| PV in 1981 of Real Dollars | | | | | 1619[2] | 254 | 127 | 150 | 83 | 55 | 53 | 35 | 2 | | 2378 |
| Cumulative Fill Capability (MMB) | | | | | 250[2] | 251 | 267 | 343 | 417 | 467 | 563 | 580 | 580 | 580 | |
| Annual Fill (MMB) | | | | | 93[2] | 104 | 70 | 76 | 74 | 50 | 96 | 17 | | | 580 |
| Oil Cost (in Millions of $) | | | | | | | | | | | | | | | |
| Nominal Dollars | | | | | 1350[2] | 3925 | 2960 | 3551 | 3782 | 2746 | 5662 | 1061 | | | 25037 |
| Real Dollars | | | | | 1653[2] | 3925 | 2691 | 2935 | 2841 | 1875 | 3515 | 598 | | | 20033 |
| PV in 1981 of Real Dollars | | | | | 2117[2] | 3925 | 2224 | 2426 | 2134 | 1280 | 2182 | 337 | | | 16847 |

[1] Includes withdrawal Engineering, Sustaining Operations and Phase III A/E Contract

[2] Cumulative total through FY 1980

## TABLE A-2

## PROJECT DATA SHEET

## WEST HACKBERRY 30 MMB COEXPANSION

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | |
| BA | 1 | 3 | 34 | 13 | 13 | 15 | 17 | | | | 96 |
| BO | | 2 | 21 | 22 | 13 | 1 | 24 | 10 | 2 | 1 | 96 |
| Real (1981) Dollars | | 2 | 17 | 17 | 9 | 1 | 14 | 5 | 1 | - | 66 |
| PV in 1981 of Real Dollars | | 2 | 14 | 13 | 6 | - | 8 | 3 | - | - | 46 |
| Cumulative Fill Capability (MMB) | | | | | -11 | -25 | +18 | +30 | +30 | +30 | |
| Annual Fill (MMB) | | | | | -11 | -14 | +43 | +12 | | | 30 |
| Oil Price: | | | | | | | | | | | |
| Nominal Dollars | | | | | 55.51 | 60.02 | 64.65 | 69.61 | | | |
| Real Dollars | | | | | 42.48 | 43.75 | 45.06 | 46.42 | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | |
| Nominal Dollars | | | | | -611 | -840 | 2780 | 835 | | | 2164 |
| Real Dollars | | | | | -467 | -613 | 1938 | 557 | | | 1415 |
| PV in 1981 of Real Dollars | | | | | -319 | -380 | 1094 | 286 | | | 681 |

## TABLE A-3

## PROJECT DATA SHEET

## WEST HACKBERRY - 30 MMB DEFERRED

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | |
| BA | | | | 9 | 35 | 16 | 38 | 42 | 22 | - | 162 |
| BO | | | | 2 | 25 | 27 | 43 | 39 | 21 | 5 | 162 |
| Real (1981) Dollars | | | | 2 | 17 | 17 | 24 | 20 | 10 | 2 | 92 |
| PV in 1981 of Real Dollars | | | | 2 | 12 | 11 | 14 | 10 | 5 | 1 | 55 |
| Cumulative Fill Capability (MMB) | | | | | | | 1 | 14 | 30 | 30 | |
| Annual Fill (MMB) | | | | | | | 1 | 13 | 16 | | 30 |
| Oil Price: | | | | | | | | | | | |
| Nominal Dollars | | | | | | | 64.65 | 69.61 | 74.94 | | |
| Real Dollars | | | | | | | 45.06 | 46.42 | 47.81 | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | |
| Nominal Dollars | | | | | | | 65 | 905 | 1199 | | 2169 |
| Real Dollars | | | | | | | 45 | 603 | 765 | | 1413 |
| PV in 1981 of Real Dollars | | | | | | | 25 | 309 | 357 | | 691 |

# TABLE A-4

## PROJECT DATA SHEET

## BIG HILL - 100 MMB

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | | |
| BA | 1 | 81 | 355 | 78 | 64 | 42 | 40 | 51 | | | | 712 |
| BO | | 47 | 175 | 195 | 130 | 58 | 41 | 54 | 7 | 5 | - | 712 |
| Real (1981) Dollars | | 43 | 145 | 147 | 89 | 36 | 23 | 28 | 3 | 2 | - | 516 |
| PV in 1981 of Real Dollars | | 39 | 120 | 110 | 61 | 22 | 13 | 14 | 1 | - | - | 380 |
| Cumulative Fill Capability (MMB) | | | | | | 1 | 25 | 100 | 100 | 100 | 100 | |
| Annual Fill (MMB) | | | | | | 1 | 24 | 75 | | | | 100 |
| Oil Price: | | | | | | | | | | | | |
| Nominal Dollars | | | | | | 60.22 | 64.65 | 69.61 | | | | |
| Real Dollars | | | | | | 43.75 | 45.06 | 46.42 | | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | | |
| Nominal Dollars | | | | | | 60 | 1552 | 5221 | | | | 6833 |
| Real Dollars | | | | | | 44 | 1081 | 3482 | | | | 4607 |
| PV in 1981 of Real Dollars | | | | | | 27 | 610 | 1787 | | | | 2424 |

## TABLE A-5

## PROJECT DATA SHEET

## BIG HILL - 140 MMB

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | | |
| BA | 1 | 81 | 390 | 78 | 64 | 42 | 40 | 50 | 53 | - | - | 799 |
| BO | | 47 | 184 | 221 | 130 | 58 | 41 | 56 | 50 | 7 | 5 | 799 |
| Real (1981) Dollars | | 43 | 152 | 166 | 89 | 36 | 23 | 29 | 23 | 3 | 2 | 566 |
| PV in 1981 of Real Dollars | | 39 | 126 | 125 | 61 | 22 | 13 | 15 | 11 | 1 | 1 | 414 |
| Cumulative Fill Capability (MMB) | | | | | | | 13 | 60 | 140 | 140 | 140 | |
| Annual Fill (MMB) | | | | | | | 13 | 47 | 80 | | | 140 |
| Oil Price: | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | 64.65 | 69.61 | 74.94 | | | |
| Real Dollars | | | | | | | 45.06 | 46.42 | 47.81 | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | 840 | 3272 | 5995 | | | 10107 |
| Real Dollars | | | | | | | 586 | 2182 | 3825 | | | 6593 |
| PV in 1981 of Real Dollars | | | | | | | 331 | 1120 | 1784 | | | 3235 |

# TABLE A-6

## PROJECT DATA SHEET

## NEW 120 MMB SOLUTION-MINED SITE

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | | |
| BA | | | 66 | 145 | 397 | 202 | 60 | 66 | 73 | 40 | | 1049 |
| BO | | | 55 | 131 | 355 | 236 | 84 | 65 | 72 | 45 | 6 | 1049 |
| Real (1981) Dollars | | | 45 | 98 | 242 | 147 | 47 | 33 | 34 | 19 | 2 | 667 |
| PV in 1981 of Real Dollars | | | 37 | 74 | 165 | 91 | 27 | 17 | 16 | 8 | 1 | 436 |
| Cumulative Fill Capability (MMB) | | | | | | | | 14 | 60 | 120 | 120 | |
| Annual Fill (MMB) | | | | | | | | 14 | 46 | 60 | | 120 |
| Oil Price: | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | 69.61 | 74.94 | 80.02 | | |
| Real Dollars | | | | | | | | 46.42 | 47.81 | 49.24 | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | | |
| Nominal Dollars | | | | | | | | 975 | 3447 | 4801 | | 9223 |
| Real Dollars | | | | | | | | 650 | 2199 | 2954 | | 5803 |
| PV in 1981 of Real Dollars | | | | | | | | 334 | 1026 | 1252 | | 2612 |

# TABLE A-7
## PROJECT DATA SHEET
## COTE BLANCHE - 40 MMB

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | |
| BA | | 213 | 4 | 7 | | | | | | | 224 |
| BO | | 54 | 106 | 61 | 3 | | | | | | 224 |
| Real (1981) Dollars | | 49 | 88 | 46 | 2 | | | | | | 185 |
| PV in 1981 of Real Dollars | | 45 | 73 | 35 | 1 | | | | | | 154 |
| Cumulative Fill Capability (MMB) | | | | 18 | 40 | 40 | 40 | 40 | 40 | 40 | |
| Annual Fill (MMB) | | | | 18 | 22 | | | | | | 40 |
| Oil Price: | | | | | | | | | | | |
| Nominal Dollars | | | | 51.11 | 55.51 | | | | | | |
| Real Dollars | | | | 41.24 | 42.48 | | | | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | |
| Nominal Dollars | | | | 920 | 1221 | | | | | | 2141 |
| Real Dollars | | | | 742 | 935 | | | | | | 1677 |
| PV in 1981 of Real Dollars | | | | 557 | 639 | | | | | | 1196 |

## TABLE A-8
## PROJECT DATA SHEET
## STEEL TANKS - 40 MMB

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | |
| BA | 6 | 496 | | 1 | 2 | 3 | 5 | 5 | | | 518 |
| BO | | 38 | 58 | 105 | 117 | 104 | 60 | 36 | | | 518 |
| Real (1981) Dollars | | 35 | 48 | 79 | 80 | 65 | 34 | 18 | | | 359 |
| PV in 1981 of Real Dollars | | 32 | 40 | 59 | 55 | 40 | 19 | 9 | | | 254 |
| Cumulative Fill Capability (MMB) | | | | | 8 | 20 | 32 | 40 | 40 | 40 | |
| Annual Fill (MMB) | | | | | 8 | 12 | 12 | 8 | | | 40 |
| Oil Price: | | | | | | | | | | | |
| Nominal Dollars | | | | | 55.51 | 60.02 | 64.65 | 69.61 | | | |
| Real Dollars | | | | | 42.48 | 43.75 | 45.06 | 46.42 | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | |
| Nominal Dollars | | | | | 444 | 720 | 776 | 557 | | | 2497 |
| Real Dollars | | | | | 340 | 525 | 541 | 371 | | | 1777 |
| PV in 1981 of Real Dollars | | | | | 232 | 326 | 305 | 191 | | | 1054 |

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# TABLE A-9

## PROJECT DATA SHEET

## STEEL TANKS - 30 MMB

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities (in Millions of $) | | | | | | | | | | | |
| Nominal (Budget) Dollars | | | | | | | | | | | |
| BA | 6 | 29 | 388 | 1 | 2 | 3 | 4 | | | | 433 |
| BO | | 35 | 1 | 104 | 135 | 86 | 72 | | | | 433 |
| Real (1981) Dollars | | 32 | 1 | 78 | 92 | 53 | 41 | | | | 297 |
| PV in 1981 of Real Dollars | | 29 | 1 | 59 | 63 | 33 | 23 | | | | 208 |
| Cumulative Fill Capability (MMB) | | | | | 8 | 20 | 30 | 30 | 30 | 30 | |
| Annual Fill (MMB) | | | | | 8 | 12 | 10 | | | | 30 |
| Oil Price: | | | | | | | | | | | |
| Nominal Dollars | | | | | 55.51 | 60.02 | 64.65 | | | | |
| Real Dollars | | | | | 42.48 | 43.75 | 45.06 | | | | |
| Oil Cost (in Millions of $) | | | | | | | | | | | |
| Nominal Dollars | | | | | 444 | 720 | 647 | | | | 1811 |
| Real Dollars | | | | | 340 | 525 | 451 | | | | 1316 |
| PV in 1981 of Real Dollars | | | | | 232 | 326 | 255 | | | | 813 |

## TABLE A-10
## BUDGET AUTHORITY REQUIREMENTS
## 750 MMB BASELINE SYSTEM
## (BA IN MILLIONS OF DOLLARS)

| | Through FY 1980 | FY 1981 | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | FY 1987 | After FY 1987 | TOTAL[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| **580 MMB BASE MODULE** | | | | | | | | | | |
| Planning | 48 | 8 | 9 | 9 | 8 | 6 | 6 | 6 | | 100 |
| Oil Acquisition and Transportation | 3,478 | 3,230[2] | 3,604 | 4,328 | 2,924 | 4,348 | 3,032 | 111 | | 25,136 |
| Storage Facilities Development | 1,396 | 81 | 94 | 161 | 147 | 136 | 108 | 82 | | 2,225 |
| Program Direction | 29 | 11 | 12 | 12 | 13 | 13 | 13 | 14 | | 118 |
| Subtotal | 4,951 | 3,330 | 3,719 | 4,510 | 3,092 | 4,503 | 3,160 | 213 | | 27,580 |
| **30 MMB WEST HACKBERRY COEXPANSION** | | | | | | | | | | |
| Oil Acquisition and Transportation | | | | | | -1,031 | +1,300 | +1,254 | +641 | +2,164 |
| Storage Facilities Development | | +1 | +2 | +36 | +13 | +13 | +15 | +17 | | +95 |
| **140 MMB BIG HILL** | | | | | | | | | | |
| Oil Acquisition and Transportation | | | | | | | +420 | +3,744 | +5,943 | +10,107 |
| Storage Facilities Development | | +1 | +81 | +308 | +70 | +64 | +42 | +40 | +103 | +780 |
| **TOTAL BASELINE SYSTEM** | | | | | | | | | | |
| Planning | 48 | 8 | 9 | 9 | 8 | 6 | 6 | 6 | | 100 |
| Oil Acquisition and Transportation | 3,478 | 3,230 | 3,604 | 4,328 | 2,924 | 3,317 | 4,752 | 5,109 | 6,584 | 37,406 |
| Storage Facilities Development | 1,396 | 83 | 178 | 505 | 230 | 213 | 165 | 139 | 103 | 3,100 |
| Program Direction | 29 | 11 | 12 | 12 | 13 | 13 | 13 | 14 | | 118 |
| TOTAL BA[1] | 4,951 | 3,331 | 3,803 | 4,923 | 3,183 | 3,550 | 4,936 | 5,268 | 6,687 | 40,724 |
| Outlays | 2,413 | 3,401 | 3,625 | 3,806 | 4,429 | 2,424 | 4,947 | 4,734 | 10,858 | 40,636 |

[1] Totals may not agree with detail due to rounding

[2] Includes $342 million of entitlements

### CUMULATIVE FILL CAPACITY
### (MMB END OF FISCAL YEAR)

| | Through 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Module | 230 | 251 | 267 | 343 | 417 | 467 | 550 | 513 | 500 | 580 | 580 |
| West Hackberry | | | | | | -11 | -25 | +18 | 30 | 30 | 30 |
| Big Hill | | | | | | | 13 | 80 | 140 | 140 | |
| 750 MMB System Total | 230 | 251 | 267 | 343 | 417 | 456 | 538 | 611 | 670 | 750 | 750 |
| Annual Fill (MMB) | | | | 76 | 74 | 39 | 82 | 73 | 59 | 80 | |
| Average Daily Fill (MBD) | | | | 208 | 203 | 107 | 225 | 200 | 162 | 219 | |

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## TABLE A-11
## BUDGET AUTHORITY REQUIREMENTS
## 790 MMB UNDERGROUND SYSTEM
## (BA IN MILLIONS OF DOLLARS)

| | Through FY 1980 | FY 1981 | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | FY 1987 | After FY 1987 | TOTAL[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 750 MMB BASELINE SYSTEM (TABLE A-10) | 4,951 | 3,333 | 3,883 | 4,933 | 3,183 | 3,550 | 4,935 | 5,268 | 6,687 | 40,724 |
| 40 MMB COTE BLANCHE INCREMENT | | | | | | | | | | |
| Planning | | | | | | | | | | |
| Oil Acquisition and Transportation | | | | | +2,141 | | | | | +2,141 |
| Storage Facilities Development | | | +213 | +4 | +7 | | | | | +224 |
| Program Direction | | | +1 | +2 | | +1 | +1 | | | +5 |
| TOTAL 790 MMB SYSTEM | | | | | | | | | | |
| Planning | 48 | 8 | 9 | 9 | 8 | 6 | 6 | 6 | | 100 |
| Oil Acquisition and Storage | 3,478 | 3,230 | 3,684 | 4,328 | 5,065 | 3,317 | 4,752 | 5,109 | 6,584 | 39,547 |
| Storage Facilities Development | 1,396 | 83 | 391 | 589 | 245 | 213 | 165 | 139 | 103 | 3,324 |
| Program Direction | 29 | 11 | 13 | 14 | 14 | 14 | 14 | 14 | | 123 |
| TOTAL BA[1] | 4,951 | 3,333 | 4,097 | 4,939 | 5,332 | 3,550 | 4,936 | 5,269 | 6,687 | 43,094 |
| OUTLAYS | 2,413 | 3,401 | 3,680 | 3,952 | 5,105 | 3,955 | 4,947 | 4,735 | 10,808 | 42,995 |

[1] Totals may not agree with detail due to rounding

## CUMULATIVE FILL CAPACITY
## (MMB END OF FISCAL YEAR)

| | Through 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 750 MMB Baseline System | 250 | 251 | 267 | 343 | 417 | 456 | 538 | 611 | 670 | 750 | 750 |
| Cote Blanche | | | | | 18 | 40 | 40 | 40 | 40 | 40 | 40 |
| 790 MMB System Total | 250 | 251 | 267 | 343 | 435 | 496 | 578 | 651 | 710 | 790 | 790 |
| Annual Fill (MMB) | | | | 76 | 92 | 61 | 82 | 73 | 59 | 80 | |
| Average Daily Fill (MBD) | | | | 208 | 252 | 167 | 225 | 200 | 162 | 219 | |

## TABLE A-12
## BUDGET AUTHORITY REQUIREMENTS
## 890 MMB MIXED SYSTEM
## (BA IN MILLIONS OF DOLLARS)

| | Through FY 1980 | FY 1981 | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | After FY 1987 | FY 1987 | TOTAL[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 790 MMS UNDERGROUND SYSTEM (TABLE A-11) | 4,951 | 3,333 | 4,097 | 4,939 | 5,332 | 3,550 | 4,936 | 5,269 | 6,687 | 43,094 |
| 100 MMB STEEL TANKS INCREMENT | | | | | | | | | | |
| Planning | | | +2 | +1 | | | | | | +3 |
| Oil Acquisition and Transportation | | | | | +666 | +1,746 | +2,114 | +1,314 | +279 | +6,119 |
| Storage Facilities Development | | +18 | +554 | +776 | +3 | +6 | +9 | +13 | +5 | +1,384 |
| Program Direction | | | +1 | | | +1 | +1 | +1 | +2 | +6 |
| TOTAL 890 MMB MIXED SYSTEM | | | | | | | | | | |
| Planning | 48 | 8 | 11 | 10 | 8 | 6 | 6 | 6 | | 103 |
| Oil Acquisition and Transportaiton | 3,478 | 3,230 | 3,684 | 4,328 | 5,731 | 5,063 | 6,866 | 6,423 | 6,863 | 45,066 |
| Storage Facilities Development | 1,396 | 101 | 945 | 1,365 | 248 | 219 | 174 | 152 | 108 | 4,708 |
| Program Direction | 29 | 11 | 14 | 14 | 14 | 15 | 15 | 15 | 2 | 129 |
| TOTAL BA[1] | 4,951 | 3,351 | 4,654 | 5,716 | 6,001 | 5,303 | 7,060 | 6,597 | 6,973 | 50,606 |
| OUTLAYS | 2,413 | 3,401 | 3,791 | 4,013 | 5,418 | 5,564 | 7,315 | 7,017 | 11,576 | 50,507 |

[1] Totals may not agree with detail due to rounding

## CUMULATIVE FILL CAPACITY
## (MMB END OF FISCAL YEAR)

| | Through 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 790 MMB System | 250 | 251 | 267 | 343 | 435 | 496 | 578 | 651 | 710 | 790 | 790 |
| 100 MMB Steel Tanks | — | — | — | — | — | 24 | 60 | 92 | 100 | 100 | 100 |
| 890 MMB System Total | 250 | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 | 890 |
| Annual Fill (MMB) | | | | 76 | 92 | 85 | 118 | 105 | 67 | 80 | |
| Average Daily Fill (MBD) | | | | 208 | 252 | 233 | 323 | 288 | 184 | 219 | |

## TABLE A-13
## BUDGET AUTHORITY REQUIREMENTS
## 1,000 MMB MIXED SYSTEM
## (BA IN MILLIONS OF DOLLARS)

| | Through FY 1980 | FY 1981 | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | FY 1987 | After FY 1987 | TOTAL[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 890 MMB MIXED SYSTEM (TABLE A-12) | 4,951 | 3,351 | 4,654 | 5,716 | 6,001 | 5,303 | 7,060 | 6,597 | 6,973 | 50,606 |
| 110 MMB SALT DOME INCREMENT | | | | | | | | | | |
| Planning | | | +4 | +2 | +2 | +2 | +1 | +1 | +2 | +14 |
| Oil Acquisition and Transportation | | | | | | | | +487 | +7,936 | +8,423 |
| Storage Facilities Development | | | | +66 | +145 | +397 | +202 | +60 | +179 | +1,049 |
| Program Direction | | | | +1 | +1 | +1 | +1 | +1 | +5 | +10 |
| TOTAL 1,000 MMB MIXED SYSTEM | | | | | | | | | | |
| Planning | 48 | 8 | 15 | 12 | 10 | 8 | 7 | 7 | 2 | 117 |
| Oil Acquisition and Transportation | 3,478 | 3,230 | 3,684 | 4,328 | 5,731 | 5,063 | 6,866 | 6,910 | 14,799 | 54,089 |
| Storage Facilities Development | 1,396 | 101 | 945 | 1,431 | 393 | 616 | 376 | 212 | 287 | 5,757 |
| Program Direction | 29 | 11 | 14 | 15 | 15 | 16 | 16 | 16 | 7 | 139 |
| TOTAL BA[1] | 4,951 | 3,351 | 4,658 | 5,785 | 6,149 | 5,703 | 7,264 | 7,146 | 15,095 | 60,102 |
| OUTLAYS | 2,413 | 3,401 | 3,795 | 4,071 | 5,552 | 5,922 | 7,553 | 7,103 | 20,193 | 60,002 |

[1] Totals may not agree with detail due to rounding

### CUMULATIVE FILL CAPACITY
### (MMB END OF FISCAL YEAR)

| | Through 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 890 MMB System | 250 | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 | 890 |
| 110 MMB Salt Dome | | | | | | | | | 14 | 60 | 110 |
| 1,000 MMB System Total | 250 | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 824 | 950 | 1,000 |
| Annual Fill (MMB) | | | | 76 | 92 | 85 | 118 | 105 | 81 | 126 | 50 |
| Average Daily Fill (MBD) | | | | 208 | 252 | 233 | 323 | 288 | 216 | 345 | 137 |

## TABLE A-14
## BUDGET AUTHORITY REQUIREMENTS
## 1,000 MMB STEEL TANKS SYSTEM
(BA IN MILLIONS OF DOLLARS)

| | Through FY 1980 | FY 1981 | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | FY 1987 | After FY 1987 | TOTAL[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 890 MMB MIXED SYSTEM (TABLE A-12) | 4,951 | 3,351 | 4,654 | 5,716 | 6,001 | 5,303 | 7,060 | 6,597 | 6,973 | 50,606 |
| 110 MMB STEEL TANKS INCREMENT | | | | | | | | | | |
| Planning | | | +3 | +2 | +2 | +2 | +1 | +1 | +2 | +13 |
| Oil Acquisition and Transportation | | | | | | +720 | +1,881 | +2,345 | +2,383 | +7,329 |
| Storage Facilities Development | | | +18 | +115 | +1,294 | +3 | +6 | +9 | +24 | +1,469 |
| Program Direction | | | +1 | +1 | +1 | +1 | +1 | +1 | +3 | +9 |
| TOTAL 1000 MMB STEEL TANKS SYSTEM | | | | | | | | | | |
| Planning | 48 | 8 | 14 | 12 | 10 | 8 | 7 | 7 | 2 | 116 |
| Oil Acquisition and Transportation | 3,478 | 3,230 | 3,684 | 4,328 | 5,731 | 5,783 | 8,747 | 8,768 | 9,246 | 52,995 |
| Storage Facilities Development | 1,396 | 101 | 963 | 1,480 | 1,542 | 222 | 180 | 161 | 132 | 6,177 |
| Program Direction | 29 | 11 | 15 | 15 | 15 | 16 | 16 | 16 | 5 | 138 |
| TOTAL BA[1] | 4,951 | 3,351 | 4,676 | 5,834 | 7,298 | 6,029 | 8,949 | 8,953 | 11,385 | 59,426 |
| OUTLAYS | 2,413 | 3,401 | 3,795 | 4,127 | 5,538 | 5,881 | 9,005 | 9,562 | 15,606 | 59,327 |

[1] Total may not agree with detail due to rounding

### CUMULATIVE FILL CAPACITY
(MMB END OF FISCAL YEAR)

| | Through 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 890 MMB System | 250 | 251 | 267 | 343 | 435 | 520 | 638 | 743 | 810 | 890 | 890 |
| 110 MMB Steel Tanks | | | | | | | 24 | 60 | 94 | 110 | 110 |
| 1,000 MMB System Total | 250 | 251 | 267 | 343 | 435 | 520 | 662 | 803 | 904 | 1000 | 1000 |
| Annual Fill (MMB) | | | | 76 | 92 | 85 | 142 | 141 | 101 | 96 | |
| Average Daily Fill (MBD) | | | | 208 | 252 | 233 | 389 | 387 | 277 | 263 | |

# APPENDIX B
# ASSESSMENT OF IMPACT ON MODULE SCHEDULES DUE TO ADMINISTRATIVE REQUIREMENTS

The Strategic Petroleum Reserve Acceleration Report to the Secretary identifies and examines five options for increasing the capacity of the SPR system by 1989 with emphasis on taking steps to increase the near term (mid 80's) protection provided by a Strategic Reserve.

In examining the feasibility of acceleration, it is apparent that there are two major areas of constraint to acceleration even if funding is assumed to be of no concern. One is in the area of technical feasibility; the other is in the area of legal barriers which must be satisfied.

All options presented in this report are technically feasible, have development schedules that maximize all opportunities to accelerate program implementation, and are fully consistant with the plans developed for the strategic deployment of Reserve inventories. In identifying these five options, many other options that had either been considered in the past, or were being currently considered as alternatives were assessed but not presented because they were either technically infeasible, or could not conform to the requirement to develop options that would assure increased capacity over the period of time (through 1989) on which SPR development is focused.

Since the development plans for all five options are at a maximum technical feasibility level, no reengineering of design and construction is seen as a means to significantly contribute to acceleration of the schedule. In the case of legal barriers, however, a close examination of the issues involved indicated that in general, to the maximum possible extent these issues are planned for solution or accomplishment concurrent with the technical design and construction activities. Thus, it impossible to foresee in advance when these requirements, althrough very expensive and time consuming, will impinge on the overall critical path of the option. Thus, the development plans are designed to not only maximize technical feasibility, but to the extent possible to minimize the potential impact of legal and other administrative barriers on the option's development schedule.

However, it needs to be recognized that without a decision to seek in advance of such relief as a Presidential environmental exemption, all schedules are problematic and subject to delay. This is especially true for new developments such as steel tanks and a new solution-mined site, which may engender environmental opposition.

It is also worth noting that the potential advantages provided in Sec. 101(a) and (c) of the Defense Production Act (DPA) have been assessed and the conclusion has been reached that neither offers significant opportunities to overcome the potential generic problems with the supply of long lead time equipment. If a specific issue at a specific time seems capable of resolution by invoking the DPA, then it will be used.

The four major areas of legal or administrative constraints that could affect SPR acceleration are:

- publishing an Environmental Impact Statement,
- negotiating for land acquisition,
- obtaining and utilizing needed environmental permits, and
- executing a business strategy that minimizes procurement time delays.

The following discussion of each of the modules presented in the SPR acceleration report addresses each of these major legal or administrative barriers and discusses the specific plan for minimizing the adverse affect on the acceleration objective. These issues are summarized in Figure B.1: Adminsitrative Barriers to Acceleration - Assessment of Constraints.

## Base Module at 580 Million Barrels

This Base Module consists of 250 million barrels of storage capacity completed in Phase 1, 290 million barrels of storage capacity in Phase II which is substantially complete and the acceleration of the 40 million barrels of storage capacity at the Bryan Mound location originally scheduled in Phase III. This acceleration of 40 million barrels of storage capacity is made possible by the change in the EPA brine disposal permit to allow brine discharge from Bryan Mound into the Gulf of Mexico at a daily average rate of 980 million barrels rather than an average daily rate of 680 million barrels. Additionally, pumps are scheduled for installation late in 1981 to achieve this higher rate of leaching. Because of the very advanced state of SPR site development, the only environmental barrier outstanding is the actual approval of the brine disposal permit modification and this is not expected to be a problem. No land acquisition issues remain for the Basic Module and no business strategy problems remain to affect completion according to the accelerated schedule. Of course, delays are possible as a result of EPA monitoring of time discharge pursuant to the issued permit, but such problems cannot presently be predicted, and will have to be dealt with as they develop.

West Hackberry Module (Both Subalternatives)

This acceleration module contemplates the addition of 30 million barrels of storage capacity to the SPR by 1988 with oil fill beginning late in FY 1985. The schedule for developing this module is not jeopardized to any significant degree by problems associated with environmental requirements; the supplement to the EIS for West Hackberry that covers the module is scheduled for completion in October 1981 and the required environmental permits are scheduled for acquisition by mid calendar year 1983. Neither of these requirements presently is on the development plan's critical path. The land acquisition element of this module is scheduled to require one year after the completion of the EIS supplement. This is an optimal land acquisition schedule because for planning purposes it assumes land acquisition by condemnation after negotiations. Even though land acquisition will require one year under condemnation procedures, the land acquisition element is not currently on this module's development plan critical path. Throughout this module's development plan, the critical path is essentially constrained by technical feasibility and the potential impact of tight market conditions on long lead time equipment. Given these conditions, there do not appear to be significant opportunities to improve upon the current development plan's schedule by waiving environmental permits or other requirements relating to procurement.

## Big Hill

This module for SPR acceleration involves a site that has not yet been acquired for salt cavern storage development. However, environmental analyses have been completed and a process has been established for selecting an architect/engineer. The environmental impact statement requirements for Big Hill will be met with the completion of the supplement for West Hackberry in October 1981. Land acquisition is scheduled to require one year after the completion of the EIS supplement in October 1981. This time frame does not present a schedule barrier since land acquisition is not on the critical path.

The acquisition of permits is planned to occur concurrent with design and construction and, at the present time, the utilization of permit waivers is not seen as reducing the time required to implement the Big Hill development plan. As was the case in the West Hackberry module, the critical path is essentially tied to technical feasibility, i.e., design, construction, and brine leach rate, with some concern for the impact of tight market conditions on delivery of long lead time equipment.

## Cote Blanche

In this module, the Strategic Petroleum Reserve would acquire (with condemnation a serious possibility) an operating salt mine at Cote Blanche, Louisiana. The estimated storage capacity of this mine is 40 million barrels; it offers the prospect of 40 million barrels of additional protection by early in FY 1985. This very fast acceleration module is enhanced by the fact that the basic EIS was in place as of 1977 and only a supplement is required before operations could begin. This is expected to take one year and would occur concurrent with procurement of contractors and equipment. If the requirement for an environmental impact statement supplement were legislatively waived, the schedule could be advanced by five months. The land acquisition process is planned to require one year. This time frame does not present a schedule barrier since land acquisition is not in the critical path. As in the other modules, design and site construction time requirements are the critical path elements. Environmental permits are not expected to be impediments to maximum schedule implementation because the Cote Blanche mine will not require brine disposal. The other permits required are considered routine and capable of being acquired well within the time required for the technical critical path. At this time, it does not seem that the use of sole source procurement procedures could accelerate the development plan significantly. As in the other modules, however there is a possible constraint on the schedule if the tight market conditions adversely affect equipment supply. Thus, it is the tight market rather than the type of procurement procedure used that is seen as being a potential schedule problem.

## New Solution-Mined Site

In this module, the Strategic Petroleum Reserve contemplates identifying and acquiring a new site, developing the site, and creating 120 million barrels of storage capacity. Because no site specific cost, design schedule, or environmental analyses have been conducted, the time frames for EIS, land acquisition, permits, and procurement strategy are potentially more significant than in the preceding modules. However, an examination of the development plan for a new salt cavern site shows that the critical path is determined much more by the technical issues of design, construction and rate of leaching than by the administrative/legal issues. A new EIS is expected to require 18 months of which 12 months are on the critical path. If the requirement for an EIS is waived, the schedule for developing the new solution-mined site module would be advanced by approximately one year resulting in completion of planned storage capability one year earlier. Land acquisition is planned to require one year; this time frame does not present a schedule barrier since it is not on the development plan critical path. The permitting process is not on the critical path; it would occur concurrent with the design and site development elements of the development plan. As in the previous modules, the tight market for equipment supply is seen as being a potential threat to the optimal accomplishment of the development plan for the new solution-mined site.

## Tank Farms

This module involves an entirely new approach for Strategic Petroleum Reserve storage: storage of very large amounts of oil above the ground. In all other modules and in existing SPR sites, the Reserve oil is held either in underground mines or caverns leached from salt domes. This has not only been less expensive, but it has avoided some real socio-economic problems that are associated with extremely large above ground storage facilities. However, given the initial objective of this report; increase the capacity of the SPR system with emphasis on taking steps to increase near term (mid-80's) protection, steel tanks become a very appropriate option because of relatively fast development feasibility.

The potential environmental barriers associated with this module are significantly greater than those associated with the various underground storage modules. The principal problem would involve the permitting requirements under the Clean Air Act (CAA). In areas of the country where the level of pollutants in the air exceed the national standards under the CAA, no new major emission sources can be constructed unless the facilities use the latest in air pollution control equipment. Further, any increase in pollution resulting from the facility must be offet by a greater reduction in like pollutants from existing facilities. In the past this policy has not been applicable to SPR underground facilities because emissions have not been large enough to have the SPR facilities classified as major emission sources but steel storage tanks may be classified as major emissions sources. As the Government is not now a major source of hydrocarbon emissions in the Gulf, emissions offsets probably would have to be obtained by reducing emissions from private sources. However, while a private storage firm could pay another existing source the cost of installing pollution control equipment in order to obtain the necessary "offsets", the Government is prohibited from paying for improvements to private property absent specific authority from Congress. Thus the CAA could pose a significant problem which must be overcome if steel tanks are to be a viable module.

If program acceleration is considered to be a very high priority, this problem could be overcome by the President exercising his authority to waive the CAA as it applies to the SPR. In addition, should delays in schedule occur because of unexpected problems with the Environmental Impact Statement, relief could be sought by seeking a legislative waiver to the National Environmental Policy Act (NEPA).

In addition to the potential problems with the EIS and permitting process, land acquisition even by condemnation could present significant problems. The problem is that tank farm storage for many millions of barrels of oil is very large and obtrusive. Such an installation or group of installations is likely to meet with significant local resistance. A judicious site selection process could overcome much local opposition but it is appropriate to note that at best, a tank farm is likely to engender local opposition.

Procurement strategy is not seen as a significant problem other than the usual problem with tight market conditions and their potential impact on equipment delivery schedules. Steel tank storage is a familiar storage medium and design can begin at the same time as site selection and environmental impact statement.

Mr. YATES. As well as what the costs would be for implementing that report. Is that your study now?

Mr. FURIGA. It is in the study.

Mr. YATES. Okay.

Mr. VAUGHAN. Let me be sure I have it straight here, Mr. Chairman.

Mr. YATES. Go ahead.

Mr. VAUGHAN. A few moments ago, I think we said we would give you an existing GAO report done here a few weeks ago on interim storage, and the report you just asked for is on accelerating our permanent storage.

You have both pieces of the puzzle if you have those two.

Mr. YATES. Let's have them both. The GAO report was not made available to us. Make that available, too, if you would.

### ALTERNATIVE STORAGE

You say the Japanese are using oil tankers for temporary storage or permanent storage; is that a feasible method for us as well?

Mr. VAUGHAN. It is one I listed as an alternative, yes, sir.

Mr. YATES. Okay.

Could you tell us what the annual cost per barrel would be to store oil in an oil tanker?

Mr. FURIGA. We have had general discussions with a number of firms offering floating tankers and depending on the charter, whether the tankers are anchored or slow-steaming, the estimate is on the order of $1.20 a barrel a year up to $1.80, or $2 a barrel per year.

Mr. YATES. How does that compare with underground storage?

Mr. FURIGA. It is hard to compare the two because the interim storage is on a per-year basis. Our salt cavern storage, the first 250 million barrels was approximately $3.50 per barrel, but that is a one-time cost.

The interim storage, if it ran for a year, that is $1.80 or so per barrel a year.

Mr. YATES. Do you know what it costs the Japanese to store oil in tankers?

Mr. FURIGA. I have no idea because it is sponsored by the Government reserve and they own the tankers, too.

Mr. VAUGHAN. Those numbers, however, Mr. Chairman, led me to say a while ago that if one ever goes to interim storage, one has very significant financial incentives to go from interim to permanent as rapidly as possible.

Mr. YATES. I see.

Mr. VAUGHAN. You notice those numbers are on the order of a third to two-thirds as large as the one-time creation of capacity charge.

We are talking some fairly sizable volumes here, so the premiums are measured in terms of billions.

Mr. YATES. The Chicago Bridge and Iron Company has estimated that costs for above-ground storage would be $7.20 a barrel. Is that about your figure, too?

Mr. FURIGA. This is for new above-ground tanks?

Mr. YATES. Yes.

**Mr. Furiga.** We looked at the Chicago Bridge and Iron estimate and it is a fairly good estimate.

**Mr. Yates.** That is expensive, isn't it?

**Mr. Furiga.** Yes, it is.

### ADVANTAGE OF BELOW-GROUND STORAGE

Doesn't compare with salt caverns.

**Mr. Yates.** What does that cost?

**Mr. Furiga.** As for the phase I, 250 million barrels, it was about $3.50 a barrel. For the phase II, the next 290 million barrels, since we sunk the capital costs of the pipelines and terminal into phase II, it is $2.40 for the next 290 million barrels, so it is hard to compete with the salt cavern.

**Mr. Yates.** Phase III?

**Mr. Furiga.** I believe it is $4.15 a barrel for phase III. There was a brand new site for phase III, that is why the price goes up.

**Mr. Yates.** You have the below-surface facilities you have to install again.

**Mr. Furiga.** Right.

**Mr. Yates.** What about the question of fire? Is that under control?

**Mr. Vaughan.** The real advantage, Mr. Chairman, of below-ground storage, in addition to cost, is the minimum vulnerability to fire because we have experienced a fire in the program.

**Mr. Yates.** That is why I asked you the question.

**Mr. Vaughan.** Of course. We did not have nearly the exposure we would have had, had we been above ground. You have got a break in the pipe or wellhead on fire.

Secondly, there is a subsequent security problem. You are much more secure against sabotage or as a target from a military perspective with below-ground storage than you are with a tank farm.

**Mr. Yates.** What percentage of salt dome oil can be recovered?

**Mr. Furiga.** We have looked at that in the concept of above-ground steel tanks and our analysis concludes that in either medium, salt caverns or above ground, the nonrecoverable losses are much less than 0.25 percent.

So it is a wash between the two storage systems.

### BIG HILL DEFERRAL

**Mr. Yates.** You want to defer $52,860,000 for funds appropriated for phase III development. Is that strictly a budgetary decision or is there a program-related decision for it?

**Mr. Vaughan.** Strictly budgetary.

**Mr. Yates.** What effect does the deferral have on storage capacity?

**Mr. Vaughan.** It defers the completion of the program by 1 year, from 1989 to 1990, and it begins to affect capacity in 1987.

**Mr. Yates.** Would you expect additional costs as a result of the deferral?

**Mr. Furiga.** Yes. The 1-year slip will cost an additional $95 million in facilities and approximately $530 million in oil money.

**Mr. McDade.** In the last phase?

Mr. **Furiga**. Delayed purchase of the oil for that year will cost an additional $530 million. That is for oil in 1990 that we would have bought in 1989.

Mr. **McDade**. You are assuming an increase in price at that point?

Mr. **Furiga**. Yes.

Mr. **Vaughan**. Anybody's scenario in out years, Mr. Chairman, calls for increasing prices within 2 or 3 years out, to resume the growth curve.

Mr. **McDade**. The deferral is about a $600 million cost, then?

Mr. **Furiga**. In the out years, yes.

Mr. **Yates**. Suppose the Congress does not go along with the deferral? How much more money would you need to keep the phase III development on schedule?

Mr. **Furiga**. We would require the $53 million deferral restored very quickly. The last day I had was 1 May. We would have——

Mr. **Yates**. Why is May 1 the last day?

Mr. **Furiga**. That is not set in concrete, but that was to keep to our schedule of land acquisition and letting solicitations to buy long-lead equipment. That was, say, for this spring.

We would have to condemn the land since we have lost time in the land acquisition phase. We would have to condemn the land and we would need approximately $200 million over our 1983 budget to start these procurements.

That is approximately what it would take to put the Big Hill back on schedule for completion in 1989, versus 1990.

Mr. **Yates**. How important is the May 1 date? Suppose it is June 30, for instance?

Mr. **Vaughan**. Frankly, Mr. Chairman, that May 1 date was a planning number when the budget was put together. As Mr. Furiga testified, it is not cast in concrete. Those kinds of dates can slip 30 or 60 days, and I don't think it would cause significant problems.

Mr. **Yates**. Cost consequences?

Mr. **Furiga**. No, sir, I don't think so.

Mr. **Vaughan**. Certainly I don't think they will be substantial, if at all.

Mr. **Yates**. Okay.

Mr. **Vaughan**. When you say 3 or 6 months, yes, you will start adding costs.

### PURCHASE OF MEXICAN OIL

Mr. **Yates**. How well is the agreement with the Mexican Government for purchase of oil operating? Any problems?

Mr. **Furiga**. No. No problems other than normal buyer-seller problems, bad weather, happens to everyone. Sometimes our schedules get a little behind, but we have made it up. It is good weather down there again.

We have had no problems on the contracts.

Mr. **Yates**. No problems in the negotiations with the Government?

Mr. **Furiga**. None whatsoever.

Mr. **Yates**. Okay.

Mr. VAUGHAN. The SPR did that, Mr. Chairman. The contract looks like a Government-to-Government negotiation but was done on an oil company-to-oil company basis, in effect.

So on the Government-to-Government nature is the fact that the SPR happens to be a Government program and PEMEX happens to be an oil company.

Neither the Secretary of Energy, nor the Assistant Secretary's Office engaged in the negotiations.

The program people did, in their usual manner, and the Mexican Government did likewise. So you really had as close to an oilman's deal as I think you could get in dealing with Government-to-Government.

## CONSENT ORDERS

Mr. YATES. Chevron was to provide oil to the Strategic Petroleum Reserve. Has it done so?

Mr. FURIGA. It has supplied a million barrels and that has been delivered.

Mr. YATES. Okay. Are you aware of any other consent orders which will provide oil to the reserve?

Mr. VAUGHAN. Counsel informs me, Mr. Chairman, there is a proposed consent order published with Quaker State. It is not final.

Mr. YATES. Is that the only other one?

Mr. VAUGHAN. The only other one, yes.

Mr. YATES. Last year you were talking about——

Mr. VAUGHAN. There is another one, Mr. Chairman. Let me correct my past statement.

There is another one under negotiation, and I believe it would be inappropriate to tell you any more on that one, at this point.

Mr. YATES. What about the State of Alaska providing oil to SPRO?

Mr. VAUGHAN. The program, after extensive negotiations, was unable to reach a mutually satisfactory arrangement with the State of Alaska, and they are not a supplier.

## OIL QUALITY INVESTIGATION

Mr. YATES. The Wall Street Journal for Tuesday, March 23, raises the question as to whether the Government has been defrauded by sellers providing the Government, under your purchase contracts, with oil below the quality contracted for.

What is the situation in that respect?

Mr. VAUGHAN. Mr. Chairman, there is an ongoing investigation that has been under way now for, to my knowledge, approximately the past 3 months, participated in by the Department of Energy's Inspector General and an organized crime strike force in the Department of Justice.

We are fully cooperating in that investigation in the program by providing samples and arranging for their testing.

Our chief concern at this juncture is to very carefully assist them in preserving the chain of custody of that evidence, if it turns out to be evidence, and then after they have finished with it, we, of course, are interested to see if there is any impact upon the program.

Figure B.1. Administrative Barriers to Acceleration - Assessment of Constraints

| | ENVIRONMENTAL IMPACT STATEMENT | LAND ACQUISITION | PERMITS | BUSINESS STRATEGY |
|---|---|---|---|---|
| Base Module | No EIS action unaccomplished. | Not applicable to Base Module. | EPA approval required of brine disposal permit to increase average daily rate from 680 MMB to 980 MMB from Bryan Mound. Permit modification applied for in Feb 1981. | No problems foreseen. |
| West Hackberry (both modules) | Supplement required for Phase III-scheduled for completion Oct 1981.<br>• Not on critical path | Shortest time may begin upon completion of EIS (Oct-81) process requires 1 year.<br>• Not on critical path | Scheduled for acquisition by mid CY 1983.<br>• Not on critical path | No viable method for accelerating the procurement process yields scheduling benefits.<br>• Of minor significance to critical path |
| Big Hill | Supplement required for Phase III - included in West Hackberry action.<br>• Not on critical path | Shortest time - same time frame as West Hackberry.<br>• Not on critical path | Ample time provided in development plan. No need for waivers anticipated.<br>• Not on critical path | Principal constraints related to tight market conditions.<br>• No significant opportunity to affect critical path |
| Cote Blanche | Basic EIS published 1977 - supplement expected to require 1 year - waiver saves 5 mos.<br>• Waiver provides no significant opportunity to affect critical path. | Est. begin mid FY 1983.<br>• Critical path unaffected | No brine disposal issue. Other permits seem to be routine.<br>• Not on critical path | Schedule for development is currently at optimum level. No viable method for accelerating the procurement process yields scheduling benefits.<br>• No significant opportunity To affect critical path |
| New Solution-Mined Site | Basic EIS requires 18 months - 12 months are on critical path. If EIS requirement did not exist, schedule could be reduced by one year. | Condemnation needs 1 year after EIS. Negotiation could be shorter if concurrent with EIS.<br>• Not on critical path | Permits to be sought concurrent with LLE, design, and site development.<br>• Not on critical path | Principal constraint to acceleration of schedule is related to tight market conditions.<br>• No significant opportunity to affect critical path |
| Tank Farms (systems alternatives 3 and 5) | EIS not in critical path because design process for tank farm can proceed concurrently.<br>• Not on critical path | Not in critical path - EIS and acquisitional land occur concurrent with system design.<br>• Not on critical path | Permits could be difficult with respect to Clean Air Act. Schedule more than 24 months to resolve this problem before permits affect the critical path.<br>• Not on critical path | Design/procurement schedule concurrent with EIS/Land Acq. Schedule. No viable method for accelerating the procurement process yields scheduling benefits.<br>• No significant opportunity to affect critical path |

At most, the impact would be limited to one cavern. This dates back to 1977, in the earliest stages of the program when oil was being put in one of the first caverns before pipelines were in place and while we were barging.

I believe that were I to go much further, I would transgress the idea of letting that Grand Jury and the Department of Justice go ahead with their process.

Mr. YATES. Of the 250 million barrels of oil in storage, how much of it is under investigation?

Mr. VAUGHAN. At the outside, there are 9 million barrels in that cavern, that was the total amount ever barged. So that is the total scope.

Mr. YATES. Nine million barrels at a monetary value of how much?

Mr. FURIGA. It was bought for approximately $13.50 a barrel back in those days.

Mr. YATES. So that would be what, 130 million?

Mr. VAUGHAN. Something like that.

Mr. FURIGA. That is the maximum being looked at.

Mr. YATES. How do you know that the rest of the oil is below quality; by testing?

Mr. FURIGA. By testing, and as Mr. Vaughan said, this was during the barging stage back in 1977 before our permanent pipelines were completed between our marine terminal and the site. We now have completely closed systems from our terminal to our storage sites with Government-owned pipelines. The crude oil is tested prior to tanker off-loading and further tested while it is in storage. The oil is sent directly to our storage site. There is no third party involved as there was in 1977 with the barging.

That was an interim stop-gap fill measure put in place back in the old days.

Mr. VAUGHAN. Let me also say, Mr. Chairman, that if you go back and look at the records that the program had in 1977 and the processes they had in place to protect the Government's investment, it seems to me they met a standard of prudence; they had triple-signed certificates and testing of all loads and all shipments; and all of that documentation appears to be in order.

Of course, that kind of documentation exists throughout the program. That is not to say it is impossible to have defrauded the program, but it certainly seems to me that by any standard of reasonableness and prudence, the program was set up properly and operated properly in that regard.

Mr. YATES. Where did the oil that is alleged to have been inferior in quality come from?

Mr. FURIGA. I don't know. A variety of sources.

Mr. YATES. You say it was barged in. Was it domestic or foreign oil?

Mr. FURIGA. It was foreign crude which was brought to a third party, and barged up to the site.

Mr. YATES. Suppose the investigation shows that the 9 million barrels were, in fact, inferior in quality. What recourse do you have to recover the cost? You say a Grand Jury is looking at it, but I wonder about the possibility of recovery.

Mr. VAUGHAN. Until we in the program, Mr. Chairman, know with greater specificity who the suspects are, and it would not be appropriate for us to know at this time. I can't answer that question.

I will tell you that the records set up and kept by the program certainly should enable us to go back to all handlers and suppliers, because the records are in order.

Mr. YATES. Certainly it is a substantial amount of money, and I would hope that not only would criminal penalties be applicable, but civil recoveries as well.

Mr. VAUGHAN. I can assure you that when that data is turned over to us, we shall proceed in that manner as soon as we are fully free of not fouling up the criminal investigation.

Mr. YATES. Okay.

If additional storage funds are provided after you undertake additional purchases which require storage in Big Hill, would you be subjected to the same danger of receiving inferior oil?

Mr. FURIGA. No. As I say, Mr. Chairman—the allegation involves a period in the program where there was an interim-fill facility involved.

Big Hill would not be using barges. There will be identifying pipelines and so on.

Mr. VAUGHAN. You do hit on a point and I think it is an important one. If we go to any form of temporary or interim storage—I think this is the thrust of your question—I think we would have to recognize that certainly you do have a higher exposure because you are——

Mr. YATES. You would be required to have a higher rate of inspection, wouldn't you?

Mr. VAUGHAN. We would have to do some real scurrying around to provide adequate protection and it would be a challenge.

Now, we are basically on a few highly secure Government sites where we totally control all inputs and outputs. The availability to lease will certainly increase the exposure to exchanges and that sort of thing.

I think that would have to be one of the recognized risks of an interim storage program.

### GAO REPORT ON CAPACITY AND OIL QUALITY

Mr. YATES. There is a GAO report of December 31, 1981, entitled "Strategic Petroleum Reserve: Substantial Progess Made, But Capacity and Oil Quality Concerns Remain." On page 43 of that report, it is said, "While the 1976 SPR crude oil quality specs and oil acquisition strategy were based on an analysis of U.S. refiners' capabilities and product needs, 1980 and 1981 changes to the acquisition strategy and quality specifications, which allowed purchase of heavier, lower-quality oil, were not based on similar analysis.

"Although DOE awarded a $250,000 contract in May 1981 to perform such an analysis, the study will not be completed until August 1982.

"In the interim, DOE has continued to purchase lower-quality oil without the needed analysis, most recently the August 1981 PEMEX contract."

How do you respond to that?

Mr. **Furiga**. Well, I don't agree with GAO. Their reference to low-quality crude is a relative term. It is compared to our type-1 light sour crude. The GAO issued an earlier report where they recommended that the Department look at acquiring Alaska crude for the reserve. That was in 1980.

We revised our specification to accommodate Alaskan North Slope oil. Quite a quantity was coming into the Lower 48. We are storing Alaskan North Slope in segregated caverns which are devoted to Alaskan North Slope-type crude.

On the Mexican crude, we did assess what we felt the refiners in the future would be using and it is true that in that Mexican agreement, we are taking a certain percentage of Mayan crude, along with the light sour Isthmus generic, this is the type-1 specification.

We bought Isthmus in previous years. It is a good quality, light sour crude oil.

We are segregating Maya in phase II caverns. Based on our percentage off-take, which we consider very favorable—that is, light crude to the Maya crude—the total is something like 110 million barrels that we will have delivered in the PEMEX contract and only 20-some-million barrels will be Maya crude.

That is being processed right now in this country. In some cases, it is processed straight. In most cases, it is being blended anywhere from a portion of 30 to 33 percent down to 4 percent Maya to the light crude.

So by keeping it segregated, we have the capability to provide it, in the event of a drawdown, any way they want it.

### PRIVATE STORAGE OF OIL

Mr. **Yates**. If your emergency preparedness program is successful in increasing the level of privately held stocks, will that alleviate the need for some part of the SPR?

Mr. **Vaughan**. No, sir.

Mr. **Yates**. It won't for a while, will it?

Mr. **Vaughan**. No, sir, and we do not anticipate that private stocks are likely to reach a level that would displace the SPR.

There are two different ways of approaching the problem. One of the things that this Administration would like to do is encourage the public, particularly large consumers and oil companies, to help themselves in the event of shortages from their storage, rather than leave it to Uncle Sam.

Mr. **Yates**. How would they do that?

Mr. **Vaughan**. If they store and we assure them we won't take away from them their own stored oil which our predecessors did, there is some encouragement to store oil.

It is in the vein that we are trying to encourage people to help themselves.

It is my judgment, Mr. Chairman, that if we were not in rather significantly poor economic times, high interest rates, et cetera, we would probably be meeting with some success with that program.

We are moving to disincentives, I think we have removed virtually all the disincentives to self-help.

### SPR DRAWDOWN

**Mr. Yates.** If the country were to encounter a need to withdraw oil from the Strategic Petroleum Reserve, how much oil could be withdrawn on a daily basis?

**Mr. Vaughan.** Currently, Mr. Chairman, with the storage level of 250 million barrels, we could withdraw 1.7 million barrels a day. When the program reaches its completion, we would be able to withdraw 4.5 million barrels per day.

**Mr. Yates.** How recently have you tested the system to see if oil can be withdrawn efficiently?

**Mr. Furiga.** In the spring of 1980, we had two tests, one was a surprise test at one of our sites which we did not know was going to be called, and the test went very successfully.

Then we had a full-system test later on in the spring of 1980, in which all the systems performed as they were designed. Actually, it exceeded the test performance criteria.

**Mr. Yates.** That is a year ago.

**Mr. Furiga.** Yes.

**Mr. Yates.** Do you have any doubts that the system would still work if you have to call on it?

**Mr. Furiga.** I personally don't have any doubts, no doubts.

**Mr. Yates.** What administrative action would be required to take oil out of the Strategic Petroleum Reserve? What do you need, an order from the President?

**Mr. Furiga.** The law requires that the President make the decision.

**Mr. Yates.** All right.

What is—suppose the emergency arose and the President said, "Take oil out and distribute it."

What is your procedure for distribution of the oil?

**Mr. Vaughan.** The basic approach that we have considered with the most effort in this Administration was, Mr. Chairman, under the Office of Energy Emergencies, to be an auction approach and then the oil distribution industry would be primarily in charge of distributing the oil.

**Mr. Yates.** They could charge anything they wanted, couldn't they, if there is no oil available as a result of some embargo, failure, or catastrophe, and it is necessary to call on the Strategic Petroleum Reserve, then the sky is the limit on the price of that oil, isn't it?

**Mr. Vaughan.** In theory, Mr. Chairman. However, we have a full range of options with respect to the distribution of that oil.

**Mr. Yates.** But I understood you to say earlier that the market would determine the price.

**Mr. Vaughan.** It is the intent of this Administration to allow market forces to operate to the extent possible and certainly the intent and policy of this Administration is that that would be done even with the use of the Strategic Petroleum Reserve crude.

I would also say—

**Mr. Yates.** How do you do that if you have a limited quantity of oil available? The country would be in worse shape than having to rely on OPEC. You will let the oil companies bid up the price of oil.

The only ones who will have availability to the supply will be those who can afford to buy it, isn't that correct?

Mr. VAUGHAN. That is certainly a theoretical conclusion. I don't think it will go like that.

I would also point out to you, sir, that in this country, there is no chance that you would have a total cut-off since we produce over half of our own oil domestically. You would have somewhere between roughly 3 months to 4 months in the pipeline at any time a major disruption occurs; for the disruption to be of real significance to this country, to go back to the type thing we had in 1973-1974, there is only one place in the world I could conceive of where that set of events could occur. That would be Saudi Arabia, and for that to occur, I think we are going to be in another series of very significant foreign policy considerations. In effect, the only country in the world that can do that is the USSR—the type of catastrophic and total elimination that you describe.

This country, for its foreign acquisitions, has a mixture. It taps more sources than any other major country in the world, and therefore, is less vulnerable, relatively, than any other country.

Mr. YATES. What is your estimate of the present value of the oil in storage?

Mr. FURIGA. I'll provide that for the record, Mr. Chairman.

Mr. YATES. All right.

Mr. FURIGA. We have an average price but I don't have the detailed figures to multiply it out.

[The information follows:]

### ESTIMATED VALUE OF CRUDE OIL STORED IN THE SPR

On March 31, 1982, the inventory of crude oil stored in the Strategic Petroleum Reserve was 248,537,469 barrels. The Energy Information Administration's April 1982 report of official crude oil prices expressed in dollars per barrel shows the average US, imported barrel of oil cost $34.24. By this method, the current market value of the crude oil stored in the SPR is $8.5 billion. The cost of these barrels was approximately $7 billion.

Mr. VAUGHAN. Mr. Chairman, may I go back to a point?

Mr. YATES. Sure.

Mr. VAUGHAN. You were discussing the GAO report concerning the Strategic Petroleum Reserve a few moments ago. I believe we formally responded to that report and I would be glad to furnish the committee with our formal response to that report.

Mr. YATES. That's fine.

[The information follows:]

## DOE COMMENTS ON GAO REPORT
## "STRATEGIC PETROLEUM RESERVE: SUBSTANTIAL PROGRESS MADE, BUT CAPACITY AND OIL QUALITY CONCERNS REMAIN"
## EMD-82-19

Following are the General Accounting Office (GAO) recommendations to the Secretary of Energy and the Department of Energy's (DOE) related comments.

### GAO Recommendation

"...that the Secretary of Energy:

—Evaluate options for achieving an average annual fill rate of 300,000 barrels per day assuming the planned and other SPR sizes. The evaluation, which should be available for fiscal year 1983 congressional budget deliberations, should assess costs and benefits of alternatives to constructing new underground storage facilities, including such options as leasing temporary storage capacity."

### DOE Comment

During 1981 and early 1982, the Department completed evaluations of a dozen different Strategic Petroleum Reserve size/schedule alternatives for permanent storage facilities development, and we believe that this aspect of the GAO recommendation to the Secretary has been satisfied. It needs to be recognized that Section 160(c)(2) of the Energy Policy and Conservation Act as amended by the Omnibus Budget Reconciliation Act of 1981, establishing a target fill rate of 300,000 barrels per day until attainment of a cumulative fill of 750 million barrels, would imply completion of a 750 MMB Reserve in late calendar year 1986, the first quarter of FY 1987. Because of fill schedule slippage experienced in the previous Administration, it is not feasible to attain 750 MMB in permanent SPR storage within this time frame.

With respect to temporary storage, the Department is considering various alternatives as part of the normal process of SPR program planning. However, such interim storage is most appropriately viewed as a supplement to, rather than a substitute for, permanent storage facilities development. Such storage is presumably intended by the GAO recommendation to be temporary, until the oil inventory can be stored in permanent facilities. It therefore is not an "alternative" to constructing new underground storage facilities, which remains the least costly form of long-term storage.

While the Department's investigations of temporary storage opportunities are not complete, there is a growing body of evidence that even with a major temporary storage initiative (which would require additional appropriations), the SPR is unlikely to achieve 750 MMB by calendar year 1986. Since permanent SPR storage capacity of 538 MMB is now forecast for the end of FY 1986, as much as 200 MMB in temporary storage would be required by that date, and it is unlikely that the private sector oil logistics system can readily accommodate such a requirement while maintaining private inventories at sufficient levels.

## GAO Recommendation

"...that the Secretary of Energy:

—Emphasize crude oil quality in acquiring oil for the SPR under current specifications, to the extent that availability and prices of such crudes allow."

## DOE Comment

The risks seen by GAO in SPR storage of heavy, high-sulfur crude oil are exaggerated. As stated in the GAO report, a 1980 National Petroleum Council report estimated that by 1982, 24 percent of U.S. refinery capacity would be devoted to processing heavy, medium and high-sulfur crudes including Alaskan North Slope (ANS) oil. This equates to over 4.4 million barrels per day of refining capacity. At maximum rate, the SPR drawdown capability of heavy, high-sulfur crude is less than one million barrels per day. It should also be noted that, at completion, the SPR fill plans call for less than 10 percent of the total crude stored to be the heavy, high-sulfur type. That is to say that over 90 percent of the crude stored will be either light, medium to high-sulfur crude or light, low-sulfur crude. In light of expected product demand during a crude oil supply interruption, the SPR's mission to supplement the Nation's crude oil supply requirements is not adversely affected by storing a limited amount of heavy, high-sulfur crude. As recommended by the GAO report, the SPR will continue to emphasize current quality specifications in acquiring crude oil to the extent that availability and prices of such crude allow.

## GAO Recommendation

"...that the Secretary of Energy:

—Require that the Deputy Assistant Secretary for the SPR document the rationale for any future lowering of SPR oil quality specifications. Such documentation should address key reasons for the change, such as the availability and comparative costs of higher quality crude oils."

## DOE Comment

Changes in crude oil quality specifications for the SPR have not been made without significant study and analysis of current trends in product demand, refining capability and crude oil availability. As noted in the GAO report, the Turner, Mason, and Solomon (TMS) study was based on 1974 data and projected product demand and U.S. refining capability only thru 1980. The resulting specifications have required revision based on SPR operating experience, market trends, crude oil availability and changes in refining capabilities derived from experience and discussions with industry technical personnel. Whereas these changes have not been a result of a single comprehensive documented study such as the TMS study, the aggregate amount of continuous study and analysis on the subject subsequent to the TMS study has at least equated the original effort. The resulting acquisition of a limited amount of heavier, high-sulfur crudes is more consistent with the broad range of SPR mission requirements than would have been the case if the original specifications had been followed without modifications. As recommended by the GAO report, the SPR will continue to document the rationale for any future changes in SPR oil quality specifications, to promote better understanding of programmatic decisions.

GAO Recommendation

"...that the Secretary of Energy:

--Make a decision no later than September 30, 1982, on whether the quality specifications and acquisition strategy for SPR oil should be revised. The results of the ongoing studies of oil quality and the size of the reserve should be useful in making that determination."

DOE Comment

SPR crude oil quality specifications and acquisition strategy are subjects of continuous study and analysis in order for the SPR to be in a position to fulfill its mission based on the most current profile of the crude oil refining industry. To fix crude oil specifications and acquisition strategy without allowing for exceptions to accommodate the changing industry would create numerous obstacles toward overall SPR fill and drawdown mission requirements. By September 30, 1982, the results of on-going analyses will provide additional insight into the current and future trends of the crude oil market and refining industry which will be of significant value and which will be used in future crude oil acquisition decisions.

DOE Comment to Expressed GAO Concern:

Concerns expressed by GAO pertaining to capacity are overstated. The SPR's Phase II expansion program is on schedule. The expansion schedule was originally developed with contingencies for unforeseen operational delays. To date those delays have not exceeded these contingencies. The leaching problems referred to in the GAO report have not had any delaying effect on the oil fill or capacity development schedule.

Mr. VAUGHAN. A few moments ago, Mr. Chairman, in discussing Alaskan oil, I stated that we had no Alaskan oil in the reserve.

We have not arranged a deal with the State of Alaska. There is some Alaskan oil in the reserve, to which Mr. Furiga referred, that came through commercial sources.

I just wanted that answer to be precisely correct.

### INCREASE IN NON-PHASE SPECIFIC ACTIVITIES

Mr. YATES. You have asked for an additional $45,246,000 in non-phased specific activities because of "a large backlog of unfunded safety, security and reliability projects."

What do you mean by that?

Mr. FURIGA. We have an ongoing program, Mr. Chairman, to upgrade the facilities that were first started in construction back in 1977 and being built in 1978 and 1979.

As we proceeded through the construction programs, we had changes in various State codes, wanted to upgrade our fire protection systems, for example, build spare parts warehouses that were not envisioned back in 1976 when the program was put on paper.

We want to——

Mr. YATES. $45 million is a large backlog, isn't it?

Mr. FURIGA. Yes, it is.

Mr. YATES. How many items are in the backlog?

Mr. FURIGA. There are a number of them.

Mr. YATES. Give us a delineation of those items for the record, if you would, as to what is implicit in this $45 million backlog.

[The information follows:]

## FACILITIES DEVELOPMENT AND OPERATIONS NON-PHASE SPECIFIC ACTIVITIES

The FY 1983 Non-Phase Specific Facilities budget request is for $86,728,000, an increase of $45,246,000 over FY 1982. The majority of this increase is in the Safety, Reliability and Security Upgrades subcategory. Details of the FY 1983 request appear below:

| | (BA in thousands) | | |
|---|---|---|---|
| | FY 1982 | Change | FY 1983 |
| Continuing Engineering ................ | $ 8,250 | $ 398 | $ 8,648 |
| Operations and Maintenance ............ | 19,300 | 18,045 | 37,345 |
| Safety, Reliability and Security Upgrades ............................ | 13,932 | 26,803 | 40,735 |
| Total ............................... | $ 41,482 | $ 45,246 | $ 86,728 |

Continuing Engineering is a subcategory required to budget for those engineering services that are concerned, on a continuing basis, with activities that have an overall project impact rather than a specific phase or site impact.

| | (BA in thousands) FY 1983 |
|---|---|
| System Engineering - System design, integration and system operation and management. | $6,000 |
| Geotechnical Support - Conducts geotechnical investigations, site characterization studies, and provides engineering design assistance regarding geotechnical concerns. | 2,000 |
| Drilling Sustaining Engineering. | 250 |
| Quality and Reliability Assurance. | 398 |
| Total Continuing Engineering | $8,648 |

The Operations and Maintenance (O&M) function provides funding for ongoing operation of the SPR. In general, the practice has been to include most operation and maintenance costs for a site in the appropriate Phase budget through fill of the site; this practice is not uniform for all sites because of the decision in 1979 to leave some Phase I sites temporarily unfilled for policy reasons. The increase in O&M Funding in this Non-Phase Specific category is in part caused by a shift in cost attribution for on-going operation and maintenance functions after completion of Phase I fill during FY 1982. The following table describes proposed uses of Operations and Maintenance Funds in FY 1983.

| | (BA in thousands)<br>FY 1983 |
|---|---|
| Operations - Ongoing operations, oil injection and metering for non-expansion (Phase I) sites. | $16,203 |
| Maintenance - Normal maintenance for non-expansion (Phase I) sites. | 3,019 |
| Security - Security guards and equipment at all sites. | 4,071 |
| Spares - Procurement of spare parts for site maintenance. | 2,701 |
| Utilities - Electrical power for Bayou Choctaw, Weeks Island, and Sulphur Mines. | 650 |
| Environmental - Ongoing environmental requirements. | 2,181 |
| O&M Contractor Fee and Special Projects - Provides O&M contractor fee, drawdown and special reports. | 6,577 |
| Support Services - Subcontract funds for Operations and Maintenance Support, including crude oil gauging, analysis and quality tests; maintenance of brine disposal wells; and transportation and storage of brine and oil samples. | 1,943 |
| Total Operations and Maintenance | $37,345 |

The Safety, Reliability and Security Upgrades activity accounts for funds used to improve SPR Facilities to meet higher standards for safety, reliability, and security than those incorporated into the original design criteria. As a national security and financial asset of the Federal Government, the SPR program needs to meet some criteria which may exceed the normal industry practices relied on for original design decisions. The following table describes the proposed uses of funds in FY 1983:

| | (BA in thousands)<br>FY 1983 |
|---|---|
| Design: | |
| Title II Detailed | $ 5,200 |
| Title III Inspection | 4,000 |
| Construction Management Services: | |
| Funding for the Resident Constructor (RC) to provide the personnel, materials, equipment and other management services to support the Safety, Reliability and Security Upgrades activity. The RC will Construct Work Orders necessary to achieve the safety, reliability, and security criteria of the SPR. | 10,000 |
| Construction Safety: | |
| Bryan Mound | 895 |
| West Hackberry | 100 |
| Bayou Choctaw | 180 |
| Weeks Island | 1,615 |
| Sulphur Mines | 810 |
| St. James | 577 |
| Reliability: | |
| Bryan Mound | 2,810 |
| West Hackberry | 4,250 |
| Bayou Choctaw | 2,833 |
| Weeks Island | 3,655 |
| Sulphur Mines | 1,045 |
| St. James | 1,765 |
| Security: | |
| Radio communications systems (including towers, etc. to insure clear communication under emergency conditions). | 1,000 |
| | $40,735 |

Each of the above tasks in Non-Phase Specific has been selected through a review and prioritization process.

Mr. **Vaughan**. Let me give you some examples, Mr. Chairman.

I have visited the site. This program was put into effect, as you know, some years ago on a crash basis. It was designed here in Washington by the Department of Energy, without consulting the oil industry, done essentially in-house for all intents and purposes.

It is not surprising, at least to me, that when you go and look at the facilities that they have created, some of the standard practices of the oil industry, things that the oil industry would have been glad to tell you for nothing, that you need safety stairs and railings for the points at which the valves exist because they are 10 and 12 feet off the ground. A man can be hurt. So those are being retrofitted in the program because the program must adhere to safety laws, et cetera.

### OIL ON ORDER

Mr. **Yates**. Is there any limit to the undelivered orders that you have at this time?

Mr. **Furiga**. Oil?

Mr. **Yates**. Yes, oil.

Mr. **Furiga**. With the way we are procuring oil for fiscal year 1982, we will have approximately 69 million barrels on order at the end of the fiscal year, for delivery in fiscal year 1983.

At the end of 1983, we will have approximately 45 million barrels on board for delivery in fiscal year 1984.

I don't know of a limit.

Mr. **Yates**. I see.

Do you have any questions in that regard?

### OIL DISTRIBUTION

Mr. **McDade**. If I may, just a couple.

I have in front of me your annual report which lists your sites across Texas through Lousiana. I was interested in the comments about these areas being "government-controlled, site-secure", et cetera.

In the event the President signs the order to withdraw, how will you get this oil around the country? How will it happen?

Mr. **Vaughan**. When the basic location decisions of the program were made, Congressman, they were made on the basis of taking a careful look at where is the center of mass of the Nation's refining industry, and where is it all connected.

If you do such an analysis, you will find that the answer lies in the Gulf Coast region, the very region where the storage sites are, and that those sites are connected through pipelines and through terminals to the vast bulk of the Nation's refining capacity.

In fact, from there, you can radiate really out through the heartland of the country with relative ease, plus there are port facilities if you need to ship.

Mr. **McDade**. Would you have to go to tankers?

Mr. **Vaughan**. Only if we had to go to the West Coast and to the East Coast itself. But the actual heartland of this country, the interior——

Mr. McDade. You are talking about refining, but I am talking about distribution. Hanging my hat on the East Coast as I do, I see all the plants and imported oil that comes into the East Coast.

I know it is just a theory, but are you going to have to tanker it up the East Coast after you withdraw it?

Mr. Vaughan. It would be distributed from the—the program would no longer be involved, of course.

Mr. McDade. You certainly must know what the normal industry practice is to get that cracked product to the East Coast.

Mr. Vaughan. Some by tanker, some by pipeline, some of both.

Mr. McDade. If you want to go off the record and correct it, I would like to get an answer.

Mr. Winkler. A lot of this would be in the pipelines.

Mr. McDade. What percentage would go that way? Can you estimate that for us, through the pipelines?

Mr. Winkler. One of the problems you have in trying to be very specific, at this point, in knowing where it is going to go, is if you postulate it will be auctioned, a lot will depend on who buys it and for what reason.

The mix at any time, will depend on the world situation, why we use the SPR, how long we intend to use it, who suffers the shortages? There are so many different ways.

That is one of the reasons it was put where it is because you have so many different options. The idea is the SPR would be made available for the marketplace and then, depending upon where the market needs it, it would be going to that location.

But there are virtually an infinite number of possibilities throughtout the country, with the limited exception possibly of the West Coast.

Mr. Furiga. Since that publication was issued, sir, we have tied into the route facility, that is the Louisiana Off-shore Oil Port, which gives us access to the St. James on the Mississippi down through the LOOP pipeline to the off-shore oil port where they offer VLCC's.

It is the only VLCC port in the United States. Recently we brought a VLCC in there, off-loaded it, brought it back up to our St. James terminal and the savings in transportation for that one cargo was $750,000. Just one cargo.

Mr. McDade. I am trying to get a fix on your answer to my question. A lot of these sites are inland. I recognize we certainly ought to put them where the cracking is to be done.

### CONNECTIONS BETWEEN STORAGE FACILITIES

What I am trying to get at is, are all of these various domes interconnected to enable you to draw from one to the other, or are they separately and individually put into a loop for transportation?

Mr. Furiga. Bryan Mound is by herself in Texas. She is connected at Shreveport, Texas, for bringing tankers in or taking them out. It is also connected with the Seaway Interstate crude oil pipeline at that point.

As you move over to Louisiana——

Mr. McDade. What percent are we keeping in Bryan Mound?

**Mr. Furiga.** Right now, phase-I facilities are approximately 60 million barrels and phase II are being expanded to another 120 million barrels.

**Mr. McDade.** You can move it out through the pipeline or to tankers.

**Mr. Furiga.** At West Hackberry and Sulphur Mines, they are connected. West Hackberry is the largest, Sulphur Mines is the satellite.

**Mr. McDade.** How much is in each one?

**Mr. Furiga.** West Hackberry, approximately 50 million in phase I; phase II, another 160 million barrels.

Sulphur Mines, a small site, is approximately 24 million barrels. They are connected to the Sunoco Marine terminal and the Texoma Interstate crude oil pipeline.

Further on, Weeks Island, in the southern part of Louisiana, a 75-million barrel site and Bayou Choctaw, a 36-million barrel site, are connected by governmental pipelines to the Government-owned St. James terminal.

At that point, we go by tankers or up the CAPLINE pipeline to Illinois, or come back down through the LOOP system with all the local pipelines that LOOP has access to.

So we have a great deal of flexibility in moving crude through those complexes.

**Mr. Yates.** How do you serve the East Coast?

**Mr. McDade.** That is what I was talking about.

**Mr. Furiga.** Crude to the East Coast can go by tanker.

**Mr. Yates.** Not by pipeline.

**Mr. Furiga.** There is no pipeline.

**Mr. Vaughan.** There is product pipeline, though.

**Mr. McDade.** You can crack it and move it as product through pipeline or you have the option of taking it up to the cracking plants along the East Coast and crack it in those enormous complexes up there.

**Mr. Yates.** Where?

**Mr. McDade.** Delaware Valley, and up and down through that whole area. I guess most of the petroleum comes in from overseas through there.

### AUCTION OF SPR OIL

**Mr. Vaughan.** One of the advantages, Congressman, of the auctions that we are seriously looking at is, you then get to make transfers.

Once it is in oil company hands, even as Government property, we would try to do that, because no one in the oil business ever ships anything that he can trade somewhere, and avoid the shipping. The cost always adds up, you know.

So where you could swap——

**Mr. McDade.** Take a company, a U.S. company on the East Coast. Most of its product comes from overseas; I can think of several, unfortunately. We would have to hypothesize that the East Coast, which is heavily reliant upon imports and the petroleum companies that service that area, would be disadvantaged by an auction system.

Mr. **Vaughan**. Let me hypothesize how they might operate. Take East Coast company A coming in through the East Coast. Companies B, C, and D, with facilities in the Gulf, maybe the same size companies or larger, but, of course, they are importing. I suspect what happens is that company A bids and wins the auction, and then, in effect, contracts with Company B to divert one of its tankers coming into the East Coast in any event, if that is possible, so that you save that small amount of shipping, and you really crack most of that oil down there.

Mr. **McDade**. I understand that. Mr. Secretary, where I get a little lost and need your guidance is, I can't imagine how company A cannot be bidding at the absolute high-dollar figure against other oil companies since it has minimal U.S. resources.

Mr. **Vaughan**. If company A is a totally foreign, independent company, Congressman, then it is going to be in a more vulnerable position than a company that has both domestic and foreign access.

Mr. **McDade**. That is my point.

Mr. **Vaughan**. One of the things that this Administration would say to companies like that is, you had better address the future and think of some business plan to deal with that sort of thing.

Mr. **McDade**. Well, I can understand——

Mr. **Vaughan**. The alternative is to do it ourselves.

Mr. **McDade**. The other alternative is to say that company A will pay the top dollar, and pass it on to the customers on the East Coast. It has no alternative.

If it has no resources, you will have all these figures about 10 and 15 years onstream, we are configuring a short-term problem and long-term problem.

You get a short-term interruption of some magnitude, and I want to remind you of the interruption that the Iranian thing cost this country.

Mr. **Vaughan**. May I go back to that, that is the very thing we would like to avoid.

Mr. **McDade**. Let me stay on this point for a moment. It is accurate to say that we do have major East Coast companies, that do not have large domestic reserves; some do, others do not.

What troubles me about that auction system is that if you have a company that is heavily dependent on off-shore oil, it is going to have to bid the high dollar and pass that cost through the system. You will have parts of the United States paying more for utilities, home heating, gasoline, et cetera, than others. How do you get around that?

### REGIONAL OIL PRICE DISCREPANCIES

Mr. **Vaughan**. The only way I know to get around it, Congressman, is to go back to so-called price controls or entitlements. I think the history of the last 10 years has demonstrated overwhelmingly that they did not accomplish the purpose. They exacerbated the problem.

While they were well-intentioned, and rigorous attempts were made to make the programs work, I think the record is clear they did not work and you mentioned the very case, the Iranian situation.

The sad story is that in the Iranian crisis—as shown in the DOE report, CBO report, and GAO report—there was no single day this country was short crude oil.

It just thought it might be and because of that the Government was managing the wrong things, at the wrong place, at the wrong time. This Administration hopes to avoid that situation.

There will undoubtedly be some other problems of what you talk of. There will not be a uniform coast-to-coast price. Right now you don't have a coast-to-coast uniform price.

You don't have vast discrepancies, admittedly, but I cannot deny that your situation is one, that in theory, could exist.

On the other hand, part of what this Administration is trying to say to people in those situations is: Provide a way to deal with it yourselves now during the time nothing is happening. Change your way of doing business to smaller refiners. Do some combining of assets and efforts if you can't amass the capital by yourself.

There will have to be flexible looks taken at the problem, or the ultimate alternative is for having Uncle Sam doing it. Frankly, Uncle Sam did not do well with it in the past.

Mr. WINKLER. If I could add one other point that people often forget. It is not really accurate to look solely at the crisis situation, and see whether a particular part of the country is disadvantaged pricewise, compared to another part of the country.

You have to look at the long term. The fact of the matter is that the price of vulnerability to higher prices in a supply interruption really is the fact that some parts of the country perhaps, like the East Coast, are paying less right now for their oil supplies than they would, if the price they were paying truly reflected the market price plus a premium for the fact that their companies are not taking the steps perhaps that would provide protection they need.

If those same companies that are totally dependent upon foreign supplies or have divested themselves of all of their domestic reserves, had taken the resources and spent the extra in development of domestic supplies, or working out arrangements to get more secure supplies, in point of fact, the actual price today on the East Coast might have been a lot larger.

What is happening is you pay less now to take that gamble that in a future crisis, if it occurs, it will cost more.

So you sort of have to look at the long term. The same situation exists in the natural gas industry where there are interruptible contracts, which are great in the natural gas industry when there is gas and you pay less money for that. But by definition, you pay less because it is not worth as much. By the same token, people are getting a bargain to some extent now. It gets averaged out when the shortage occurs.

So you have to take that longer view to really see what the costs are.

Mr. MCDADE. That may be the light that guides you, but it doesn't me. If you want to take a company like the Sun Oil Company, you have heard of them?

Mr. WINKLER. Yes.

Mr. MCDADE. Do you have any idea how much they spent developing the tar sands?

Mr. **Winkler**. I gather from your question it was significant.

Mr. **McDade**. You don't know, do you?

Mr. **Winkler**. No, sir.

Mr. **McDade**. Do you know when they started?

Mr. **Winkler**. No, sir.

Mr. **McDade**. Well, you would find that Sun Oil is a very aggressive petroleum company in this country and because it is short of U.S. crude, they invested billions of dollars in alternative sources in Canada which helped partially.

I find it very difficult, though, to look at a scenario where we are in the midst of an energy crisis and with taxpayer-supplied funds, we are going to pose a higher tax on one portion of the country than another.

I find that hard to accept.

Mr. **Vaughan**. I hear you, Congressman, and I would——

Mr. **McDade**. There has to be a better way to do it.

### OPTIONS OF THE EXECUTIVE BRANCH

Mr. **Vaughan**. I must remind you that, of course, the current plan that is under the Act of 1976—this drawdown and distribution plan of the SPR, was filed in 1978, I believe—does allow a full range of alternatives to the President.

It was filed by the previous Administration, which was operating the price and allocation control system, and that would permit it to return.

Mr. **McDade**. What you are saying is that——

Mr. **Vaughan**. So the President has all the options.

Mr. **McDade**. What you are saying, and I think you cleared up the problem, is if there were some significant differential that there is authority within the existing law and existing executive order to attempt to remedy that.

Mr. **Vaughan**. Yes, sir. There is. There is such authority.

Mr. **McDade**. That is really the answer to the question.

Mr. **Vaughan**. The SPR is one of the key points the President could use to make those determinations. However, as we have been discussing, it is an extraordinarily complex problem because you fix one problem, only to create a myriad of others.

There were, under the old entitlements program, massive transfers.

Mr. **McDade**. I can recall all of those horror stories, and I don't want to see another one coming down the pike. I am glad to hear you give me assurances that the authorities are there, and that it is not the policy just to say, "Well, if a section of the country is being over-charged to use the national resource, that is tough." I realize you are not saying that, I am glad you are not. That's all the questions I have, Mr. Chairman.

### SALE OF NAVAL PETROLEUM RESERVE (NPR) OIL

Mr. **Yates**. Let's talk about the Naval Petroleum and Oil Shale Reserves.

The oil from NPR will be sold competitively, either directly to purchasers through the DOD, or in exchange for crude. It would be delivered to the SPR.

What are the factors that go into the decisions of who receives the oil? Do you use the same market approach?

Captain Gilmore. Mr. Chairman, effective the first of May, all the Government's share of production from the NPR will be sold to the Department of Defense. This is pursuant to the provisions of the Energy Security Act and two separate requests from Secretary Weinberger to Secretary Edwards.

He requested the NPR oil as a part of the Department of Defense's fuel oil/crude oil supply assurance program.

Mr. Yates. Are you following that policy now, or is it just in case of a shortage in the future?

Captain Gilmore. No, that will be continuous for indefinite period.

Mr. Yates. Is there a different policy for products other than oil?

Captain Gilmore. Yes, there is. Natural gas and propane, butane, natural gas are sold competitively on the open market.

## EMERGENCY INCREASE IN PRODUCTION

Mr. Yates. Earlier in this hearing, you testified that you were at your maximum productive capacity for Elk Hills.

Captain Gilmore. Yes.

Mr. Yates. Suppose there were a cutoff of imported oil? Could you increase production at Elk Hills? Does the term "maximum productive capacity" mean what it says?

Mr. Vaughan. That is maximum efficient rate.

Captain Gilmore. Without ultimate loss of recovery is what that means. We have a draft plan and can implement such a plan to increase production in an emergency. We could obtain about another 25,000 barrels of crude oil a day from Elk Hills in an emergency; and the associated gas and liquid products that come with it, if equated to barrels of oil equivalent, would be about another 15,000.

So it is about 40,000 barrels equivalent.

Mr. Yates. What effect would this have on long-term production?

Captain Gilmore. We could produce at that rate for about 90 days, with some loss of ultimate recovery, and then would have to return to a normal production rate, or something slightly below that, after that 90 days.

Mr. Yates. When you sell your oil and delivery is made, how long after that delivery is the Government reimbursed?

Captain Gilmore. We bill every 7 days and the companies that we are billing are supposed to pay within 7 days on the commercial contracts.

As I recall, on sales to DOD, we bill every 30 days. It really amounts to an intergovernmental transfer of funds.

Mr. Yates. Is DOD's credit as good as other companies?

Captain Gilmore. DOD pays promptly, yes. Companies also pay promptly, because we require that they place on deposit a letter of credit and if they don't pay promptly, we can unilaterally draw down the letter of credit for noncompliance with its terms.

## CONSTRUCTION AT NPR-1

Mr. YATES. When do you expect construction to be completed at NPR-1?

Captain GILMORE. The vast majority of that construction will be completed this fiscal year. One project recently awarded will extend into next summer. That is rehabilitation of 61 Shallow Oil Zone tank settings.

Mr. YATES. How much will that cost? Do you want to put that in the record.

Captain GILMORE. Yes, I will supply it for the record.

[The information follows:]

### COST OF REHABILITATING TANK SETTINGS AT NPR-1

The Naval Facilities Engineering Command awarded the contract to rehabilitate the 61 Shallow Oil Zone tank settings on February 23, 1982, in the amount of $5,558,000. It is estimated that the work under this contract will be completed by September 30, 1983. This is the final project remaining to be completed under the California Development Program at NPR-1.

## CONTRACTING MANAGEMENT AT NPR-3

Mr. YATES. You have had problems with contracting management at NPR-3 in Wyoming. What happened as a result of the criminal investigation?

Captain GILMORE. There was a criminal investigation pertaining to one individual who was a former head of procurement with the firm, Fenix and Scisson Associates, who no longer is our contractor at Teapot Dome.

That individual, as I understand, was convicted in court to serve, as I recall, 2½ years in jail, and 4 years on probation.

Mr. YATES. How much was the loss to the Government?

Captain GILMORE. I think, Mr. Chairman, that the actual loss was fairly small. I think the individual reportedly received a hunting rifle and a cosigner on a loan to buy a car, things of this nature. I don't believe that there has been a record of substantial losses there.

## OPERATOR FEE FOR NPR-1

Mr. YATES. You want an increase of $500,000 for the operator fee at NPR-1. Why the increase? Will they be doing additional work?

Captain GILMORE. This is NPR-1?

Mr. YATES. Yes.

Captain GILMORE. Just the larger size of our work there, the larger program at Elk Hills.

Mr. YATES. What will the contractor be doing in addition to what is currently being done?

Captain GILMORE. Well, the fee is broken into two components; a base fee which the contractor receives regardless of performance, and the award fee which is based on actual performance.

The base is normally one-third and the award fee, two-thirds under that sort of fee system. It is the value of the overall contract going up through inflation and other reasons, and the fee is based on our standard percentage of the amount of dollars we spend at Elk Hills.

Mr. **Yates**. How do you arrive at $500,000?

Captain **Gilmore**. That is using the Department of Energy procurement guidelines on what a fee would be for this scope of work under these oil field conditions.

### ELECTRICAL COSTS

Mr. **Yates**. What portion of your production operations at NPR-1 is for electricity?

Captain **Gilmore**. Our estimated electrical costs in fiscal year 1983 total $4.8 million. That compares with fiscal year 1982 costs of $3.9 million, and fiscal year 1981 costs of $2.6 million.

One of the reasons that's increasing, Mr. Chairman, is that we are converting a number of the Stevens Zone wells that had previously flowed to pumping wells as the reservoir pressure declines, and we are converting practically all of the Shallow Zone wells to electric motor-driven pumps whereas previously they had gas engines on them, which were quite unreliable. In addition, we have just completed a major waterflood project, the 31-S project at Elk Hills, and this fall, we will be completing a major water flood in the R facility.

These two major waterfloods will have a substantial pumping capacity.

### WELL DRILLING

Mr. **Yates**. How do you determine the number of developing wells you want to drill at the reserves?

Captain **Gilmore**. Primarily it is a matter of determining the best well spacing to efficiently recover the oil. In addition, with the waterflood projects that we are completing, we have to have a certain number of water injector wells.

We also need gas injector wells for pressure maintenance in the gas cap area of certain reservoirs.

Mr. **Yates**. What's the cause of the large increase for drilling and exploratory wells? According to your estimates, it will increase by more than 50 percent.

Captain **Gilmore**. Where is that? Do you have a specific reference?

Mr. **Yates**. Cost per well.

Captain **Gilmore**. Cost per well has included an inflation factor of about 15 percent from last year's cost figures.

Mr. **Yates**. Why 15 percent? Every indication is that inflation isn't anywhere near that.

Captain **Gilmore**. Well, inflation, after decontrol, or just prior to decontrol, and subsequent to that period, was about 20 to 25 percent in the drilling industry. That has, we think, moderated, and we think it will moderate further in 1983 because oil companies are having a cash flow problem and are having to reduce their exploratory drilling programs.

So we reduced it to about 15 percent.

### SECURITY

Mr. **Yates**. What problems do you have with security at NPR-3?

Captain **Gilmore**. Mr. Chairman, we don't think we have any problems with security there. We have 24-hour security at NPR-3 and at Elk Hills. There have been certain accusations about not having adequate security.

I haven't seen the basis for those. We have gate guards that check the vehicles entering and leaving the reserve. The normal method for trying to steal oil would be to suck it out of a tank by a vacuum truck.

We own vacuum trucks ourselves and do not normally have commercial trucks going in and out of the reserves. At Elk Hills, we weigh the trucks in and out to be sure we know what is entering and leaving the reserve at all times.

Our security is probably better than private oil fields.

Mr. **Yates**. Did you have to worry about tapping your lines? Is there any theft at all?

Captain **Gilmore**. Well, our lines generally are internal to the reserve and the oil is generally sold at the boundary of the reserve. So if there is any tapping, it would probably be in somebody else's line off the reserve.

Mr. **Yates**. So theft is not a problem?

Captain **Gilmore**. We don't think theft is a problem. Security is good and we think we have undertaken economical security measures that reduce the potential for theft to acceptable minimums.

Mr. **Yates**. What is the operator's fee at NPR-3 in fiscal year 1982?

Captain **Gilmore**. That fee is still being determined, Mr. Chairman, because there is a base fee that has already been set, but we determine the amount of award fee on a quarterly basis.

Mr. **Yates**. Is that the reason for the large difference in estimate of what the 1982 fee would be? The 1983 budget reflects $926,000; last year it was stated to be $514,000.

Captain **Gilmore**. The award fee amount is reduced in fiscal year 1983 from fiscal year 1982 because of a smaller scope of work.

Mr. **Yates**. Put in the record what the actual fee was, then.

[The information follows:]

### NPR-3 Operator Fee

The apparently large increase in the NPR-3 operator fee, from a fiscal year 1982 amount of $514,000 to a fiscal year 1983 request of $880,000, is due to a different method of budget presentation. The fiscal year 1983 request combines the Operations and Maintenance (O&M), Development and Enhanced Oil Recovery (EOR) portions of the operator fee under a single line item in order to provide a more comprehensive picture of the total operator fee requested and to present an approach consistent with the NPR-1 budget presentation. Previous budget submissions for NPR-3 divided the operator fee between the major activities. Thus, the fiscal year 1982 amount of $514,000 represents only the O&M portion of the operator fee, and does not include those portions of the operator fee associated with the Development and EOR activities. The fiscal year 1982 Development and EOR amounts are $171,000 and $241,000, respectively, providing for a total fiscal year 1982 operator fee of $926,000. The fiscal year 1983 request of $880,000 actually represents a decrease of $46,000 from fiscal year 1982. The fiscal year 1982 column of the fiscal year 1983 budget request has been adjusted to reflect this method of presentation.

Mr. **Yates**. Okay.

Mr. **Vaughan**. Could we give you where you think that discrepancy exists?

Mr. **Yates**. Look at page 168 of last year's hearing record in Part 8. That shows the operator fee for 1982 as being $514,000.

Mr. **Vaughan**. Thank you.

Mr. **Yates**. Your 1983 budget justification shows that fee for 1982 to be $926,000.

Mr. **Vaughan**. Thank you.

### NPR–3 DEVELOPMENT

Mr. **Yates**. Is there an advantage to drilling more than one Tensleep Step-Out well per year?

Captain **Gilmore**. There is, Mr. Chairman. Last fiscal year, 1981, we drilled two Tensleep Step-Out wells. In fiscal year 1982 we will drill one and in fiscal year 1983 we plan to drill one. There are two sands in Tensleep, A and B, and the A, we found, extends out to a broader area than the B sands.

We are trying to determine the limits of that A zone.

Mr. **Yates**. You have an enhanced oil recovery pilot program at NPR–3. Is that doing well?

Captain **Gilmore**. They're just getting under way, Mr. Chairman. At the in-situ pilot, two of the four injectors have been ignited and we have two more to ignite, so it is just getting under way.

Mr. **Yates**. When will you have information that will let you know the worth of the project?

Captain **Gilmore**. Well, late in fiscal year 1983. We have another pilot project there, the Polymer Waterflood project. We have begun injected water into the flood and we are going to continue that for about 2 months and then inject the polymer for about 4 months, following it with water again.

So it will be late in fiscal year 1983 before we can fully evaluate these projects.

### NAVAL OIL SHALE RESERVES

Mr. **Yates**. What is your estimate of the potential of the resources on the Naval Oil Shale Reserve?

Captain **Gilmore**. At Naval Oil Shale Reserve No. 1 in Colorado, we have an estimate of about 16 billion barrels in place with 2.5 billion barrels recoverable with present economics.

At Naval Oil Shale Reserve No. 2 in Utah, we estimate about 8 billion barrels in place and I don't have an estimate of the recovery. It's not as good quality oil and would not be recovered in the near term.

Mr. **Yates**. When are you going to file the final environmental impact statement?

Captain **Gilmore**. We have that put together. We have just cleared it with the Department of the Interior. We should have it published as soon as we complete the internal review, which should be within 30 to 60 days.

Mr. **Yates**. Is $90,000 adequate to maintain the land?

Captain **Gilmore**. That is adequate to do our surface maintenance out there and the minor amount of work we will be doing. We will present some proposals to DOD management this summer concerning potential development of the oil shale reserves.

Mr. **Yates**. How many acres are associated with the Naval Oil Shale Reserves?

Captain **Gilmore**. I think we have in total somewhere around 90,000 acres. I can provide the exact figure for the record.

[The information follows:]

### Acreage of Naval Oil Shale Reserves

The Naval Oil Shale Reserves consist of a total of 145,330 acres. NOSR-1 consists of 40,760 acres; NOSR-2 consists of 90,440 acres, and NOSR-3 consists of 14,130 acres.

### DEVELOPMENT OF THE OIL SHALE RESERVES

Mr. **Yates**. Is there any private interest in development of the oil shale reserves?

Captain **Gilmore**. Yes, some companies have expressed interest; at least two, to be specific.

Mr. **Yates**. When you say "expressed an interest", what does that mean? How significant an expression is that?

Captain **Gilmore**. They talked in terms of the utilization of the current tax credits to possibly build some production facilities for the Government. I don't know whether that would be feasible.

Mr. **Yates**. How much of an investment would they be willing to make, is there any indication of that?

Captain **Gilmore**. This is very general in nature, Mr. Chairman. It would take quite a bit of review to determine whether it would be feasible, but under the current tax provisions it would be possible for a company to build a facility with its own financing; lease it to the Government for a period of time; write off the expense against their other corporate earnings; and turn it over to the Government in, say, 10 years.

As I say, that is a general proposal that would have to be reviewed in detail. We do plan to look at all such proposals and other options this summer.

### NPR STAFFING

Mr. **Yates**. Your budget justification on page 122 shows you had 19 unfilled vacancies at the end of fiscal year 1981. Have those been filled?

Captain **Gilmore**. We filled some of them, Mr. Chairman.

Mr. **Yates**. What is your present employment level?

Captain **Gilmore**. I have an authorization for 120 people and currently on board, 102. We have lost some, and hired some additional people.

Mr. **Yates**. Are you having any difficulty in recruiting qualified staff?

Captain **Gilmore**. I have been having trouble recruiting petroleum engineers and engineering technicians, to be specific.

Mr. **Yates**. Do you expect to overcome that difficulty?

Captain **Gilmore**. Unless the Federal salaries can be adjusted, we will continue to have a problem. After decontrol, salaries for petroleum engineers skyrocketed. There was a lot of competition in the industry for them. The differential probably rose to as much as

30 percent between Federal salaries and industry salaries, and it was high enough that it did cause some of our engineers to leave.

We have four vacancies in the petroleum engineering staff at Elk Hills and three at Teapot Dome.

Mr. **Yates**. Let's talk about emergency preparedness now.

Mr. **McDade**. Could I ask a question, Mr. Chairman.

Mr. **Yates**. Certainly, Mr. McDade.

### SELLING PRICE OF NPR OIL

Mr. **McDade**. The old practice at the petroleum reserves was to sell competitively, taking the prices in the surrounding fields and adding an increment to it as a bonus, wasn't it?

Captain **Gilmore**. It was to sell competitively, utilizing an average of the three highest posted prices in the surrounding fields as a base price, and then letting the companies bid either above or below, or more recently, just above that price.

Mr. **McDade**. In effect, there was a bonus on top.

Captain **Gilmore**. Yes.

Mr. **McDade**. What was the rationale for that?

Captain **Gilmore**. Well, I think it was the generally high quality of the crude in the area and particularly the demand for high quality crude by refiners in the area. They had not modified their facilities to accommodate the heavy crude so they were willing to pay a bonus for high quality light crude.

Mr. **McDade**. Do you recollect the percentage of the bonus in the competitive price?

Captain **Gilmore**. Recently, the bonus was about $1.25 above the posted price on an average.

Mr. **McDade**. That is 5 or 6 percent above the average price, right?

Captain **Gilmore**. Yes, I guess. The price at that time, I think, was probably somewhere around $28 or $29 a barrel.

Mr. **McDade**. That is about 5 percent. With a withdrawal of the Elk Hills oil, we are losing that bonus, aren't we?

Captain **Gilmore**. Selling the oil to DOD we are not charging any bonus. It is very difficult to compute the cost. In fact, the sales from DOD will be an inter-governmental transfer of funds anyway. I think it is important and I think DOD agrees it is important that they pay basically the market price for their oil. If the Secretary of Energy decides to terminate this agreement, they would have to pay the same price to buy fuel commercially.

The law requires that we sell the oil to DOD at a price approximating the market price.

Mr. **McDade**. Exclusive of the bonus?

Captain **Gilmore**. Well, it doesn't talk in terms of bonus.

Mr. **McDade**. That is my question, whether or not that increment of 5 percent that we used to get at Elk Hills is gone?

Captain **Gilmore**. I think if we were selling the oil competitively now, we would not get a bonus anyway. The bonus would be pennies.

Mr. **McDade**. So you think in today's market the question is moot?

Captain **Gilmore**. Yes, sir.

Mr. McDade. Are you having any problems with product exchanges? DOD simply takes the raw product, the entire component, don't they?

Captain Gilmore. We sell the crude to DOD. They handle the oil from there; the conversion of crude to military fuels is done by them.

In terms of the bonuses, too, we believe that DOD will actually achieve a savings on their end in the acquisition of fuels. Any time that we may be foregoing the bonus because of favorable markets, they, in fact, should be achieving the same result.

Mr. McDade. Thank you, Mr. Chairman.

Mr. Yates. Do we sell any of our oil from the naval reserves to foreign countries?

Captain Gilmore. No, sir.

### DISINCENTIVES TO SELF-HELP

Mr. Yates. Emergency preparedness. What do you perceive as disincentives to private self-help?

Mr. Vaughan. Primarily, Mr. Chairman, the disincentives that were most egregious were the seizure directly and indirectly of private stockpiles. Let me tell you how this was done. When you had price and allocation controls you simply did not allow one with stocks of his own to have an allocation. That was the indirect method.

The example I recall from the past was propane, where it was embargoed and required to be released to the open market even though it belonged to specific private interests. They are the types of things that went on.

### RESPONSE TO SEVERE SUPPLY INTERRUPTIONS

Mr. Yates. On page 75, you say: "Government action could be expected only in response to extremely severe energy supply interruptions." What do you mean by "extremely severe energy supply interruptions"?

Mr. Vaughan. Well, Mr. Chairman, it's the——

Mr. Yates. At what point is that reached?

Mr. Vaughan. Mr. Chairman, that is an ad hoc judgment call that will be made on a situation analysis at the time it occurs. It is very difficult to sit here and decide in advance precisely what that will be. Let me try to illustrate why.

There have been those who have done emergency planning in the past based on levels of cutoff. How long is that cutoff to be? If you judge that the facility or if your intelligence people can tell you that the facility has been destroyed, and it is still in friendly hands, you can calculate how long it will take to put it back in operation. That is a finite period of time.

On the other hand, if it's been the act of a Government, if Mr. Haig and his people are persuasive enough, you can have things flowing quickly again or it may be a long time.

Mr. Yates. What plan of action does the Government have to take if such a situation should occur?

Mr. Vaughan. When we reach the so-called severe?

Mr. Yates. Yes.

Mr. **Vaughan**. What in reality it will do, is move with a series of escalating actions, starting from information to the public, on through such things as use of the SPR, and if necessary, all the way down to the very stream where you have to invoke things like the Defense Production Act.

Mr. **Yates**. Is your statement pursuant to a prepared plan, or is this your estimate of what is likely to happen?

Mr. **Vaughan**. This is a statement in pursuance of a planning process that is in being and is not a specific completed document. I do not expect that there will ever be a completed document.

Mr. **Yates**. Why would you expect that? I would expect you would want to know what you are going to do if that situation ever prevailed.

Mr. **Vaughan**. Because, I think, Mr. Chairman, that we will not know with sufficient specificity, the particular situation with which you will be confronted. So it seems to me that you must define a range of options far enough to be able to implement them very quickly, and an intelligence and evaluation system that allows you to provide the President with informed views as to what he should implement.

Mr. **Yates**. Well, I guess it's a question of viewpoint. According to a letter dated March 9, addressed to Congressman Sharp, a September report of the Comptroller General, stated:

"The U.S. Government is almost totally unprepared to deal with disruptions in oil imports. Oil import disruptions . . . pose a significant threat to national security, and the lack of effective contingency planning and program development to date is serious and requires immediate attention."

The letter continues: "Since then, progress has been very slow; there is still no comprehensive plan or even individual response plans in any contingency planning area which can be considered fully operational."

I take it they have made suggestions on what ought to be done. Have you replied to this letter?

Mr. **Vaughan**. Yes, sir, and I would be glad to furnish you with a copy of our formal response.

Mr. **Yates**. This letter and your formal response may go into the record at this point.

[The letter referred to follows:]

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-206525

MARCH 9, 1982

The Honorable Philip R. Sharp
Chairman, Subcommittee on Fossil
  and Synthetic Fuels
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

Subject: The Effects of the Fiscal Year 1983 Budget, Energy Reorganization, and Program Changes on U.S. Energy Emergency Preparedness (EMD-82-45)

Your January 29, 1982, letter requested that we update our analysis of energy emergency preparedness published last September 1/ by looking into the effect of continuing budget and staff reductions at the Department of Energy (DOE). You also asked us to comment on the implications the proposed energy reorganization may have on both domestic and international energy emergency preparedness and to clarify the United States' obligations under the International Energy Program. Lastly, you wanted our view on what actions should be taken to ensure adequate preparedness beyond those covered in S. 1503.

Our September report noted many weaknesses in the Government's energy emergency preparedness posture. Our conclusion was that,

> "The U.S. Government is almost totally unprepared to deal with disruptions in oil imports. Oil import disruptions * * * pose a significant threat to national security, and the lack of effective contingency planning and program development to date is serious and requires immediate attention."

Since then, progress has been slow; there is still no comprehensive plan or even individual response plans in any contingency planning area which can be considered fully operational.

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1/"The U.S. Remains Unprepared for Disruptions in Oil Imports," EMD-81-117, Sept. 29, 1981.

(001706)

## SUMMARY

As this letter shows, under its proposed budget--which is a substantial reduction from fiscal 1981 and 1982 levels --the administration has chosen to reduce contingency planning efforts in several areas. Specifically, DOE has no plans to

- --develop a surge oil production capability (except for a small capability at the Naval Petroleum Reserve at Elk Hills),
- --develop a Strategic Petroleum Reserve (SPR) drawdown policy,
- --institute a private oil stock management program, or
- --develop voluntary and mandatory demand restraint programs.

Efforts in fuel switching and international emergency preparedness would be substantially curtailed. Additionally, few resources will be devoted to studies of emergency tax/rebate systems that could be used to counter oil price increases even though the previous oil allocation systems have been discarded. The proposed fiscal year 1983 budget for emergency preparedness will further delay the completion of adequate contingency plans.

At this time, the administration has not yet released its energy reorganization plan, so we could not analyze it in detail. Our previous work in emergency preparedness organization [1] indicated that an effective planning operation needs to: (1) be centralized in one office, (2) be given a high priority, (3) be vested with adequate authority, and (4) have necessary staff available to carry out the program. It is not clear that the reorganized emergency preparedness program will have these characteristics. We note, however, that in one component of energy emergency preparedness--international preparedness--the staff is being reduced from 18 in fiscal 1982 to 6 in fiscal 1983, a reduction of two-thirds. The Department of State's component remains unchanged at 5 staff years.

Senate bill 1503 would help fill a void by giving the President authority to act in an energy emergency. While this would be a step in the right direction, emergency preparedness is more than legal authority. The Government must also have the capability to

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[1] "The Department of Energy's Reorganization of Energy Contingency Planning Holds Promise--but Questions Remain," EMD-81-57, March 4, 1981.

[COMMITTEE NOTE.—As indicated later in the transcript of the hearing, a formal response was not prepared.]

Mr. VAUGHAN. I might add, Mr. Chairman, the same study group has issued an update of that report in December where they reached similar conclusions. I would point out to you that in the view of the Administration we are talking primarily about a philosophical difference of how to approach a problem. In my judgment, the measure that GAO establishes for deciding whether we are prepared is whether we have a workable price and allocation system on the shelf. This Administration does not have such a plan for price and allocation controls, and does not intend to prepare one.

So by that standard, if that is the measure, then the report is accurate.

Beyond that, I think the report is not helpful at all. That is the nature of our response. I think we have responded to the second report.

Mr. WINKLER. If I could just——

Mr. YATES. You want to supplement what he said?

Mr. WINKLER. —correct? Are you allowed to correct his statement?

Mr. VAUGHAN. Certainly, rather than I having to do it.

Mr. WINKLER. This report was not submitted to the Department of Energy before it was tendered to Congressman Sharp. We were not consulted during the process. We did not have an opportunity to provide a great deal of information to that. So, there was no formal Department of Energy response. In fact, it was as Mr. Vaughan suggested; there are a number of inaccuracies, as well as differences of philosophy. The Department of Energy now has thousands of pages of contingency plans ranging from thousands of volumes that were made up——

Mr. YATES. None of which affect you.

Mr. WINKLER. We hope not to have to use them; that is correct.

Mr. VAUGHAN. I am sorry I misspoke when I said we had answered formally. We have certainly argued with GAO. We testified on that subject, Mr. Chairman, at some length before Mr. Sharp and that is the response, really. I will be glad to furnish that to you.

[The information follows:]

# STATEMENT OF WILLIAM A. VAUGHAN
ASSISTANT SECRETARY, ENVIRONMENTAL PROTECTION,
SAFETY, AND EMERGENCY PREPAREDNESS
DEPARTMENT OF ENERGY
BEFORE THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON FOSSIL AND SYNTHETIC FUELS
MARCH 10, 1982

Mr. Chairman, Members of this Subcommittee. Thank you for the opportunity to discuss the Department's Energy Emergency Preparedness Program.

## ENERGY EMERGENCY PREPAREDNESS GOALS AND ACTIVITIES

The overriding goals of the Energy Emergency Preparedness Program are to reduce the Nation's vulnerability to energy supply disruptions and to mitigate their impacts on the nation. Our strategy to achieve these goals is to rely primarily on the marketplace to respond to disruptions in energy supplies. Accordingly, we seek to remove barriers to short-term adjustments in the marketplace. Although the Federal Government has always sought to reduce impacts of supply disruptions on the domestic economy, this Administration has redefined significantly our method of achieving this. We have abandoned the policy of extensive Federal intervention which has proven to be ineffective in previous supply disruptions, such as oil allocation, price controls, and mandatory demand restraint measures, because we found they created or exacerbated the adverse economic and social impacts.

Since the basic problem of a major energy supply disruption is the economy's difficulty in adjusting rapidly, one useful solution is to develop adequate crude oil stocks that can be drawn down in an emergency. Both private and Government-owned stocks are effective in dealing with oil supply disruptions, associated economic losses and national security threats.

For the United States, protection against severe disruptions in petroleum supplies includes the Strategic Petroleum Reserve. This Reserve is about one-third filled, with over 241 million barrels of crude oil--more than double the amount of the reserve over a year ago. The SPR, when filled to 750 million barrels by 1990, may help deter politically inspired disruptions of U.S. imports as well as be used during a major oil emergency. The use (or drawdown) of SPR is not automatic or pre-determined. Rather, the decision to use the SPR will be based upon circumstances at a particular time. Factored into our decision will be the estimated length and severity of the disruption, as well as actions by our allies.

In addition to our commitment to the SPR, we are seeking to encourage the buildup of private stocks by suppliers and large consumers before an emergency, and we are working to remove disincentives for private stockbuilding.

Also, we have underway a number of other activities that complement the free market strategy. These include:

1. Developing a public information plan for use in energy emergencies which will lead to greater public understanding of the need for energy emergency preparedness before a crisis occurs and will provide effective communications during a crisis. An important part of this effort is to encourage suppliers and consumers, as well as State and local Governments, to develop their own contingency plans.

2. Working closely with the DOE Office of International Affairs until the office is phased out next year and the International Energy Agency (IEA). As we indicated in our July 1981 report entitled "Domestic and International Energy Emergency Preparedness," we are developing contingency plans for a National Emergency Sharing Organization and a mechanism to backstop voluntary offers by U.S. oil companies in the event the IEA emergency system is triggered. We are also developing plans for U.S. participation in the IEA's Allocation System Test-4 in the Spring of 1983.

3. Analyzing the energy requirements for the Department of Defense (DOD). DOD is the largest single energy consumer in the U.S. We are committed to providing

energy for national defense. During a major supply disruption, we have the authority under the Defense Production Act (DPA) to allocate energy supplies for national defense. We are negotiating with DOD a joint Memorandum of Understanding to establish the procedures for meeting the needs of DOD and its defense contractors. In addition, virtually the full Government share of NPR production will be available exclusively to the DOD starting in April.

4. Studying the economic effects of potential energy supply disruptions.

5. Identifying and developing plans for removing regulatory, environmental, technical and economic barriers to efficient emergency energy use. We are also examining State regulatory restrictions that could be temporarily lifted to increase oil surge production.

6. Developing and refining a daily energy situation report--an "early warning" to provide accurate and timely assessments of energy markets and conditions. In addition, we are developing a rapid information retrieval and analytical capability utilizing EIA data and expertise. These efforts are being conducted with the Energy Information Administration and other relevant DOE offices.

7. Developing a National Oil Board operations plan in support of the U.S. commitment to the NATO civil emergency planning organization and NATO Wartime Oil Organization.

Government cannot and should not attempt to accomplish the emergency preparedness task alone. To obtain needed industry expertise in planning for and during energy emergencies, we are considering the revitalization of the long dormant Executive Manpower Reserves--the Emergency Electric Power Reserve, the Emergency Petroleum and Gas Reserve and the Emergency Solid Fuels Reserve. The Reserves will provide a role for both energy producers and consumers as well as for State and local Governments, financial institutions, and other business, on a volunteer basis, without establishing a permanent bureaucracy.

ENERGY EMERGENCY PREPAREDNESS PROGRAM: FUNDING-HISTORY

Resources for the Department's Energy Emergency Preparedness Programs in FY 1980 were $14.8 million; $12.3 million in FY 81; $10.25 million in FY 82; and our FY 1983 budget request is $5.4 million.

Some of you may be concerned that our funding request for this program is substantially less than has been requested in the past. But funding requests for this area of activity in the previous Administration were based on the assumption that the

Government could meaningfully plan the allocation of petroleum during a supply disruption. We do not believe that is possible. We have a much simpler and more direct way of dealing with supply disruptions. The approach we advocate requires a lower level of funding.

Before 1981, responsibility for DOE's energy emergency preparedness program was divided among several offices, including the Emergency Conservation Office in Conservation and Solar, the Oil Supply Security Office in Policy and Evaluation, and the Offices of Emergency Coordination, Power Supply and Reliability, and Emergency Preparedness in the Economic Regulatory Administration.

As a result of the reorganization adopted by Secretary Edwards in February 1981, we are now well positioned to develop coherent emergency contingency plans for oil supply disruptions and other energy emergencies. For the first time, nearly all energy contingency planning and emergency preparedness responsibilities, including the Strategic Petroleum Reserve (SPR), the Naval Petroleum and Oil Shale Reserves program, and the Office of Energy Emergencies, are within a single office in DOE.

## GAO REPORT OF SEPTEMBER 29, 1981, ON EMERGENCY PREPAREDNESS

In regard to your question concerning our response to the GAO report of September 29, 1981, on Emergency Preparedness, I want to point out that the general thrust of the report as well as a number of the GAO recommendations reflect a fundamental difference between the Administration's energy emergency preparedness policy of primary reliance on the free market, and GAO's perception of the need for an activist and interventionist Federal Government role in planning for and implementing energy supply disruption responses through regulatory measures, such as allocation and price controls, and demand restraint measures. These measures have been tried in the past and have proven counterproductive.

EIA AND IA SUPPORT

Another area of concern raised in your letter is the support Energy Emergencies receives from EIA and IA. We have relied on both offices, to varying degrees in the past, to assist and facilitate our analysis and planning responsibilities.

EIA provides basic energy information, technical support and modeling expertise. For general market analysis, we use a variety of data sources, including EIA, intelligence information and private data to monitor the ever-changing domestic and international energy situation. In emergencies, or as special problems arise, we use these sources and our own staff analysts to assess situations and share information with other concerned officials in the Government, both Federal and State, and industry to determine if any emergency action is warranted.

Through careful planning and proper use of limited funds, we are confident that we can shift resources as needed to continue the necessary analysis to support our energy emergency preparedness planning.

Although the Office of International Affairs has been our main point of contact with the IEA, EP has developed a direct working relationship with both the State Department and with IEA for emergency preparedness planning and operations, and we have participated along with IA in a number of international activities.

In connection with AST-4, EP and IA are represented on the U.S. delegation to the AST-4 Design Group, the international body that plans the AST-4 exercise. Other participants in the Design Group are the Departments of State and Justice, the Federal Trade Commission, industry representatives, IEA Secretariat staff and other IEA members. EP's representation on the U.S. delegation to the Design Group permits us close contact with counterparts whose concerns include preparedness for an international oil supply disruption.

EP along with IA also participates in the activities of the NATO Petroleum Planning Committee. This affords other opportunities for coordination of international energy emergency work with our allies. We have additional contact with other U.S. agencies through our participation in various working groups of the President's Emergency Mobilization Preparedness Board.

We also rely upon IA to staff DOE's intelligence desk and prepare certain classified reports to support the emergency preparedness program. We believe that this latter function is absolutely essential to our emergency planning and operational responsibilities. However, this function, as well as the others now performed by IA, could be easily picked up as part of the Department of Commerce's international program, or alternatively, as part of our own activities by drawing on expertise in other agencies including the Central Intelligence Agency and the State Department. On this basis, we do not foresee any substantial problems resulting from the proposed budget reductions in the DOE international program.

## AUGMENTING STAFF DURING ENERGY EMERGENCIES

The current organization of the Office of Energy Emergencies is based on a team approach. We maximize our staff resources and coordinate our planning and operations by integrating key elements from a range of Departmental functions. Using a task force or team approach gives us the staffing flexibility to draw from a wide reservoir of talent and skills in order to address energy concerns that are diverse and cross-cutting.

Therefore, if the need arises, other people in the DOE would be available to help the Office of Energy Emergencies on an "as needed" basis. This has been done, for example, for continuity of government and defense-related activities. Naturally, since the DOE intends to rely as much as possible on free market forces to respond to energy emergencies, there will be no need for numerous Government employees to be involved in such matters.

Also, as I mentioned previously, the Executive Manpower Reserve Program will provide immediate industry experience during energy emergencies.

This concludes my presentation. I will be pleased to answer any questions.

## ECONOMIC IMPACTS OF SUPPLY DISRUPTION

Mr. YATES. You will study the financial and economic impacts of energy supply disruptions during fiscal 1982. Are you doing the study with in-house capability or by contract?

Mr. VAUGHAN. Contract, primarily.

Mr. YATES. Who is doing it for you?

Mr. WINKLER. There are a number of contracts that we are using as well as grantees. We are using ICF, Incorporated. We have issued grants to Harvard to do some work for us.

Mr. YATES. How much is it costing you?

Mr. WINKLER. The way the Department is proceeding on this is through joint contracts with a number of groups within the Department. I think the total effort is probably around $500,000 for fiscal 1982.

Mr. YATES. When do you expect to have the study completed?

Mr. WINKLER. We expect to have an initial rough cut of some specific ideas of measures to mitigate economic disruptions by the end of the summer of 1982 and some more complete analyses early in 1983. We have a number of studies that have already been done. We want to analyze them and perfect some of the additional thoughts. It is extremely complex.

## EMERGENCY EXECUTIVE RESERVE PROGRAM

Mr. YATES. Does your 1983 request cover expenses of the emergency executive reserve program at all?

Mr. WINKLER. Yes. The emergency executive reserve program is extremely minimal to run. This program is primarily——

Mr. YATES. How many executives are there, and how much does it cost?

Mr. WINKLER. Roughly six staff-years in the Department. The concept is that only a few people within the Department of Energy can maintain a much larger group of national executive defense reservists who will most of the time operate without compensation. The only time we are involved is in training and so on, and only in emergencies will we call them up and incur specific costs beyond minimal ones.

## ROLE OF STATE AND LOCAL GOVERNMENTS

Mr. YATES. Do you expect State and local energy offices to play a role in an energy emergency?

Mr. WINKLER. We have been talking with a number of State and local government associations, and our general approach is to make contact with the State, presently through the State Governor's office, and leave it to the individual States to decide if they want to continue through the State energy office or the civil defense office. We feel that is a decision of the individual State.

Mr. YATES. So you will work through the Governor's office rather than any State energy offices?

Mr. WINKLER. Our initial contact is through Governors, but we have asked them to tell us who they would like us to work with. We found that within the States there is a sensitivity, in some cases, competitiveness, and we feel it ought to be within the province of the individual States to decide.

### EARLY WARNING CAPABILITY

Mr. **Yates**. In your justification you talk about an early warning capability. What do you mean by that?

Mr. **Winkler**. One of the things that we discovered, when we came into the Department last fall was that there was not ready access to a wide range of very current data that we thought would be necessary to provide the kind of alert to potential energy problems. What we did was create a warning system, which is essentially an automated library function that is updated continually during the business week. It provides us the ability to monitor a wide range of developments.

It is tied into an alert coordination system where individuals are on call 24 hours to get warnings.

Mr. **Yates**. How much will it cost? This system is costing us approximately $3,000 a month at the moment.

Mr. **Winkler**. $3,000 a month and user fees under the EIA system. All the activities in the Office of Energy Emergencies have built upon not only our own capabilities but those of other parts of the Department as well. We are using a lot of the EIA system and are not incurring the full cost. The personnel that we projected for 1983 is 10 staffers, which is roughly $500,000. It is designed to be an in-house system, with very minimal contracts support.

### DEFENSE ENERGY REQUIREMENTS

Mr. **Yates**. One of your objectives is to develop plans for meeting defense energy requirements. Doesn't the Department of Defense maintain its own plans for this?

Mr. **Winkler**. Yes, the Department of Defense has considerable planning and readiness capability.

Mr. **Yates**. Why do you have to do it, then?

Mr. **Winkler**. The role of the Department of Energy is to implement certain statutory responsibilities under the Defense Production Act, under the NATO treaty, and in effect, we have statutory judgments to make as to whether the Department of Defense will have a claim upon us for certain volumes of product in certain circumstances. The role of the Department of Energy is to validate that and provide it when appropriate.

### PUBLIC OUTREACH ACTIVITIES

Mr. **Yates**. Why is there no longer a need to perform emergency preparedness public outreach activities?

Mr. **Winkler**. The specific budget item which was deleted financed a series of workshops throughout the country. We have an emergency public information program which is coordinated with other parts of the Department of Energy. But it is designed to be basic to the functioning of the Department, and to be a part of all of our activities rather than part-specific in workshops as such throughout the country. We are changing the focus and integrating it into one of our programs.

Mr. VAUGHAN. If I may, an extensive part of the emergency planning at the time was a complex system of price and allocation controls. We needed considerable help out there, with the public, explaining how they worked. Since there are no such plans and no such regulations on the books now, there is no need to have an extensive set of workshops to explain them to people.

### DATA FROM PRIVATE SECTOR

Mr. YATES. What kind of data from the private sector will you be using?

Mr. WINKLER. We intend to utilize whatever data are available.

Mr. YATES. You won't have much from EIA, will you?

Mr. WINKLER. We have a considerable amount of data from EIA.

Mr. YATES. You will get less and less, though.

Mr. WINKLER. One of the things we found in developing the reporting system for the energy situation is that there are a wide range of data systems in the private sector. Every major industry, every major trade association has data that they use which is, by and large, tested by the need to run their activities. Our feeling is that we can be successful in gaining access to a number of these data systems voluntarily or by modest payment; and by having access to a wide number of them, we can establish them in a continuum and that provides the check in terms of ranges of accuracy.

So, we don't feel that we would be damaged by the changes in the EIA program. I think Mr. Everett has testified that the essential data for emergency preparedness purposes will continue to be maintained by EIA.

### INTERNATIONAL ENERGY ACTIVITY REQUIREMENTS

Mr. YATES. Are we prepared to meet the requirements of the international energy program in today's time frame?

Mr. WINKLER. Yes, sir. We have on the books, a number of regulations which provide the mechanisms for implementing the EIA agreements. We are continuing to evaluate them. We are planning to participate in the tests scheduled for the spring of 1983. Through developing the procedures for that test, we will continue to refine them.

Mr. YATES. Do you count on any sources other than in the SPR, to meet this requirement? How do you stand in relation to 90 days of oil stocks without any imports?

Mr. WINKLER. The stocks in the United States now are far in excess of the 90 days, both in the private sector and in addition to——

Mr. YATES. So you would not have to use the SPR?

Mr. WINKLER. We have no plans to target the SPR to meet our international energy obligations. As Mr. Vaughan testified, the current plan would be to provide it as another mechanism into the marketplace if the President decides that it's desirable to use it. We have the authority to do that.

Mr. YATES. As I understand what Mr. Vaughan testified to, we don't have any plans to reduce oil consumption by 10 percent; on the other hand, whatever consumption is lost will be through increases in prices; is that correct, Mr. Vaughan?

Mr. **Vaughan**. That's correct.

Mr. **Yates**. How do other countries feel about this plan of ours?

Mr. **Vaughan**. The IEA staff has raised some concern about it. However, our position throughout the period to our colleagues in the Office of Energy Affairs in the Department of Energy as well as the Department of State, is that this country meets its agreements, and we do not necessarily have to detail how we will meet them. We don't find it in our best interests to prove specifically how we will meet these obligations.

We have the stocks; the IEA agreement permits aggregation of private and Government stocks. We have not chosen to detail with IEA and get locked into some predisposed manner to where IEA gets to be the organization calling the shots. Our predecessors felt the same way.

Mr. **Yates**. You say that your primary reliance on the system is for the oil companies to share equally. What happens if they don't cooperate on a voluntary basis? What are you going to do?

Mr. **Vaughan**. If our oil companies do not cooperate?

Mr. **Yates**. You indicated the oil companies would respond on a voluntary basis. Suppose they say they don't want to do that? What will you do?

Mr. **Vaughan**. We will have to consider——

Mr. **Yates**. You will cross that bridge when you come to it; I see.

Mr. **Winkler**. We have standby regulations that provide authority to mandate oil allocation among the major oil companies.

Mr. **Yates**. Mr. Vaughan said you are not going to do that.

Mr. **Winkler**. We have worked with the oil companies; as a matter of fact there is a meeting in New York tomorrow and Wednesday. The oil companies have expressed a great deal of interest in maintaining the voluntary aspect. We have no indications that the oil companies would not cooperate. They, as a matter of fact, have been extremely enthusiastic about the voluntary assurances.

Mr. **Vaughan**. Mr. Chairman, let me clarify what I have said. There is no intention or expectation of this Administration to have to resort to those kinds of mandates. But in the area of international agreements, the regulations are on the books to go to mandatory sharing if we have to, to meet our international obligations.

Mr. **Yates**. But only to meet international obligations.

Mr. **Vaughan**. To meet international obligations.

Mr. **Yates**. Okay.

Mr. McDade.

Mr. **McDade**. No questions, Mr. Chairman.

### STORAGE TANKS AT NPR-1

Mr. **Yates**. Captain Gilmore, what use are you making of the large storage tanks at NPR-1?

Captain **Gilmore**. We use them if we have any problems with our pipelines leaving the reserve so we can store the oil there temporarily, rather than shut in the wells and lose production. We have stored oil there for shipment to the SPR for a time while we are shipping minor quantities of oil to the SPR through the pipeline system.

I would imagine that should an emergency arise and a shortage come on the horizon, we might well want to put some of our oil into storage until such time as more oil becomes available.

Mr. YATES. How much storage capacity is available there?

Captain GILMORE. 1.2 million barrels.

### CLOSING REMARKS

Mr. YATES. We have some questions for you to respond to for the record.

Thank you, gentlemen, very much.

## ADDITIONAL COMMITTEE QUESTIONS

### Oil Acquisition

Question: Since you were here last year, an arrangement has been made for Mexico to provide oil for the Strategic Petroleum Reserve. Can you describe to the Committee how the agreement with Mexico operates?

Answer: This is a commercial type contract entered into by the Department of Energy and Petroleos Mexicanos, Mexico's national oil company, on August 20, 1981. It provided for the SPR to purchase 24 million barrels of crude oil for delivery thru December 31, 1981. From January 1, 1982 through August 31, 1986, the SPR is to purchase crude oil at a rate of 50,000 barrels per day. The approximate ratio of crude types will be 75 percent Isthmus and 25 percent Maya delivered on a segregated basis.

The purchase price of the oil is subject to a renegotiated adjustment on a calendar quarter basis and applies to all purchases made during that quarter. Should there be a failure to reach agreement by the 10th day of a new quarter, purchases may be suspended for that quarter. Should an agreement not be reached for two consecutive quarters, either party may terminate the contract.

The SPR pays for and takes title to the crude oil at tanker loading ports in either Mexico or at transshipment terminals in the Caribbean, primarily at the Bahamas.

The SPR then arranges for the necessary tanker transportation to its U.S. gulf terminals. Tankers are acquired for the SPR by the Military Sealift Command under an Interagency Agreement between the Department of Energy and Department of Defense.

Question: How much oil has in fact been supplied by Mexico to date?

Answer: As of April 26, 1982, 28.9 million barrels have been supplied under the contract with Petroleos Mexicanos.

Question: Over the life of the agreement, how much oil can we expect to get from Mexico?

Answer: Based on the current contract provisions, we can expect to acquire a total of approximately 110 million barrels by August 31, 1986.

## Banister Pipeline America Settlement

Question: Could you bring the Committee up to date on the settlement of the contract arbitration case between Banister Pipeline America and Parsons-Gilbane? What was at stake?

Answer: Banister Pipeline America was awarded a subcontract in 1978 to construct the oil pipeline between the SPR Weeks Island storage facility and the St. James Terminal. Unexpected delays experienced by the Corps of Engineers in obtaining right-of-way permits resulted in the Government terminating the contract. Payments totalling $16.7 million were made to Banister before 1981 under this original subcontract. Subsequently, Banister filed a claim against the SPR construction management contractor, Parsons-Gilbane.

The American Arbitration Association issued a decision in December 1981 in favor of an award to Banister in the amount of a further $12.8 million plus additional expenses. The SPR contractor and the Government took strong exception to this award. In February, a settlement was reached in the amount of $12.5 million and final payment was made to Banister on February 19, 1982, bringing the total paid to $29.2 million. This was a saving of $1.4 million under the arbiters decision.

Question: How do you plan to cover the settlement?

Answer: A reprogramming action will be required to cover the settlement paid by Parsons-Gilbane. A reprogramming proposal is being prepared for submission to the appropriate Congressional Committees.

## Other Claims

Question: Are there other cases that are now working their way towards settlement? If so, could you briefly describe them for the Committee?

Answer: The other claims pending settlement are those involving real estate condemnation and facilities construction. The real estate cases concern several Phase I sites, Sulphur Mines, Bayou Choctaw, Bryan Mound and Weeks Island. The facilities construction cases concern Phase I prime contractor and subcontract claims.

## FY 1982 Budget Reduction

Question: In order to get the FY 1982 appropriation enacted, a four percent across the board reduction was to be taken. In the FY 1982 column of the FY 1983 budget, you do not reflect an across the board four percent reduction. Rather, you have not reduced Phase II expansion sites or non-phase specific activities and have reduced Phase III new sites by more than four percent.

-- Can you please explain to the Committee why you did not take the four percent reduction proportionately?

Answer: Phase II construction and Non-Phase Specific activities are ongoing projects whereas Phase III is composed of a number of new projects some of which had not even started at the time the across the board four percent reduction was enacted. Hence, we took the four percent reduction in Phase III where there would be minimum programmatic impact.

## FY 1983 Request

Question: You are reducing the planning activity from $8,640,000 in FY 1982 to $8,000,000 in FY 1983 due to a greater emphasis on in-house studies. (p. 57) In view of the fact that your overall staffing level is to decline in FY 1983, how will you be able to accomplish more studies in-house?

Answer: Annual budget requests for contractual support for SPR planning work have declined over a period of years. This decline is due in part to the continued progress in completing the planned system. Also, some studies of prior years were of a onetime nature requiring updating rather than completely new work, and some contractual efforts created analytic tools which remain in use by SPRO staff. Finally, internal SPRO staffing allocations have changed over time and there has been constructive cooperation between SPR and other Department of Energy elements including the Office of Energy Emergencies, the Energy Information Administration, and the Office of Policy, Planning and Analysis. As a result of all these factors, two of the major recent analytic efforts regarding the Strategic Petroleum Reserve--the 1981 study on acceleration and the 1982 report on SPR size--were prepared primarily by DOE staff, while other analytic efforts continue to rely on contractual support.

Question: How much of the planning request supports emergency drawdown capability? What alternatives for drawdown are you exploring?

Answer: In FY 1983 almost $1,000,000 in the planning request is for SPR logistics systems projects such as Operational Readiness Testing, Operational Readiness Testing for Logistics Support and SPR Use Planning and Contingency Management Analysis, all of which pertain directly to physical and administrative SPR systems and practices rather than to overall strategic policies. Alternatives for drawdown policies are the responsibility of the Deputy Assistant Secretary for Energy Emergencies who currently has a study of SPR drawdown approaches underway.

Question: The table on p. 59 of the budget justification indicates that for the years 1982 through 1986 you anticipate greater storage capacity than what you were estimating last year. What has happened to enable you to increase the storage capacity?

Answer: Fiscal Year 1982 Budget storage capacity projections were based on developing Phase II caverns at Bryan Mound under a brine disposal constraint of 680,000 barrels per day. In February 1981, the SPR took steps to accelerate the leaching program at Bryan Mound. The SPR requested a modification of the brine disposal permit to increase the maximum leaching rate from 680,000 to 980,000 barrels per day. As a result the FY 1983 Budget storage capacity projections for 1982 through 1985 have increased, providing an additional 50 million barrels of Phase II storage capacity by the end of FY 1985. The SPR achieved the increased leaching capability in January 1982.

## Naval Petroleum and Oil Shale Reserves

Question: The level of production at both NPR-1 and NPR-3 is expected to decline in FY 1983. How rapidly will production decrease in future years?

Answer: The average daily production during each fiscal year, beginning with FY 1984, is expected to decline by approximately 10% per fiscal year, for both NPR-1 and NPR-3.

## Revenue

Question: You are estimating FY 1982 receipts at $1.7 billion and FY 1983 receipts at $1.65 billion. Are these estimates still valid in the face of the general decline in petroleum product prices?

Answer: The Naval Petroleum Reserves (NPR) feels that despite a general decline in petroleum product prices, the revenue estimates of $1.7 billion for FY 1982 and $1.65 billion for FY 1983 are still valid. Revenues for the first six months of FY 1982 totaled $.83 billion. Taking into account the traditional production decline occurring in the winter months and the ensuing increase expected in the summer months, revenues should closely approximate the estimates contained in the budget.

Question: If not, by how much would you revise your estimated receipts?

Answer: At this time, NPR does not feel that its revenue estimates should be revised. Periodic reviews of production and revenue estimates are made by NPR, and these estimates may be revised in the future if warranted.

## FY 1982 Appropriation Act

Question: The FY 1982 appropriation act required a 4% across the board reduction. It appears that you have deviated from the across the board reduction in NPR-1. Why did you take all of the reduction from operations and maintenance rather than from some of the other areas at NPR-1?

Answer: The 4% reduction was applied across the board at the major program element level as indicated by the Amended Conference Report. Applying the reduction across the board below this level could have seriously impacted production. The entire reduction was taken from operations and maintenance in order not to impact current production or delay the completion of major projects, and to maintain the current pace of drilling and exploration programs. The operations and maintenance reduction was taken in non-critical maintenance areas which could be deferred at the present time without seriously affecting current operations.

## NPR-3 Development Program

Question: At NPR-3, you have taken a disproportionately large reduction in the development program. What is your rationale for the revised distribution of the NPR-3 funds?

Answer: The reduction in the development program was taken in the Second Wall Creek Northern waterflood project. The reduction was taken because it represented the best business decision at that time. With a tight operations and maintenance budget and installation of the enhanced oil recovery system underway, delaying the waterflood work represented the most viable option.

## Program Direction

Question: Why was no reduction made in the program direction activity at NPR-1 and NPR-3?

Answer: Reductions were not taken in program direction at NPR-1 and NPR-3 because the current staffing allowances represent the minimum acceptable employment necessary to effectively operate the Reserves. Reductions in program direction would result in current vacancies being eliminated, many of which are critically needed petroleum engineers and technicians.

## Administrative Support

Question: Administrative support increases from $15,141,000 in FY 1982 to $17,842,000 in FY 1983. According to the justification, the increases are directly related to inflation. What rate of inflation did you use?

Answer: The FY 1983 budget request provides for an increase of $1,701,000 in administrative support, from $16,141,000 in FY 1982 to $17,842,000 in FY 1983. The rate of inflation used was 12.4%. This is based upon Nelson Cost Index averages, data supplied by Williams Brothers Engineering Company, and current Federal actions.

Question: What elements of administrative support are most susceptible to inflation?

Answer: The elements of administrative support most affected by inflation are direct labor costs including salaries, benefits, travel, overtime, and shift differential, and outside services which provides for rental of field operation and office equipment and maintenance contracts for office and field equipment.

## Production Costs

Question: What portion of the production operations request at NPR-1 is for electricity?

Answer: The FY 1983 budget request for production operations includes $3.9 million for electrical consumption.

Question: How does this compare to usage in FY 1981 and FY 1982?

Answer: Electrical consumption in FY 1981 was $2.9 million and the budgeted amount for FY 1982 is $3.5 million.

Question: For the record, provide the details of the $8,597,000 increase in production operations.

Answer: The increase of $8,597,000 in production operations is attributable to the following areas:

Labor - $2.0 million

Outside services - $2.9 million (includes engineering tests and surveys, equipment rental, instrumentation, and maintenance contracts)

New equipment - $.4 million (includes tubing, pumps, rods, line pipe, valves, vehicles and surface equipment)

Expendable supplies - $2.2 million (includes chemicals, repair parts, tools, vehicle fuel and repairs)

Electrical consumption - $.4 million

Road maintenance - $.7 million

All of the above items include increases due to additional activity and maintenance requirements and adjustments for inflation.

Development Drilling

Question: In FY 1982 you are drilling 91 development wells for $76,528,000 and in FY 1983 you plan to drill 85 wells for $89,813,000. What portion of the increase is because of inflation and what portion is because of the fact that you are having to drill deeper wells?

Answer: Approximately $2 million of the increase is attributable to the drilling of deeper wells, while $11.3 million is directly related to inflation. An inflation factor of 14.5% was used to calculate FY 1983 drilling costs. This is less than the projected 17% inflation factor in the Nelson Cost Index for drilling costs.

Question: What impact would there be on production if 10% of the wells were not drilled?

Answer: The impact on production in FY 1983 and FY 1984 would be an estimated loss in planned productive capacity of 500 barrels per day. The effect of this loss in subsequent years would decline by about 10% annually.

## Environmental Compliance

Question: Among the items requested for development facilities is $2,000,000 for environmental compliance. What type of facility will be built?

Answer: These funds were requested not for any one particular building or project, but rather to initiate a pollution control program for the many large compressor engines located throughout the field.

Question: What environmental problem are the facilities to correct?

Answer: This control program is designed to mitigate Nitrogen Oxide (NOx) emissions from these large internal combustion engines.

Question: In view of the fact that EPA and the Kern County Air Pollution Control District have not clearly defined "best control technology," how do we know that $2,000,000 will be adequate to solve the problem or if $2,000,000 is too much?

Answer: At the time the FY 1983 NPOSR budget was prepared, the issue of NOx emission control from the large field compressor engines at Elk Hills was an open question, for EPA had not yet acted on our proposal, which contained a number of NOx emission control options. We included funding for the control method we thought they most likely would choose, based on their actions regarding other oil fields in Southern California; i.e., installation of catalytic converters on all 1,000 horsepower field compressor engines. Our $2,000,000 figure was based on the component costs of the converters, which are $50.00 per engine horsepower, plus the labor costs of installation, testing, and maintenance. With over 18,000 installed horsepower to be controlled by this method, the component costs alone were about $1 million, with the additional costs of installation, testing and maintenance bringing the total cost to the $2 million figure included in the FY 1983 budget.

On February 25, 1982, which was after our budget was submitted, EPA issued its formal permit conditions for our Elk Hills operations which do not require the use of catalytic converters. We were successful in proposing a more economical solution, which utilizes much less expensive fuel/air regulators ($10,000 per engine, versus $50,000 for the converters) on some engines, and "tuning" other engines, without adding new hardware, to meet the permitted NOx emission limits. This revised program, which includes a significant amount of testing and monitoring of engine performance, is estimated to cost $500,000 in FY 1983.

## Maintenance Requirements

Question: At NPR-3, there is a slight reduction in maintenance and production systems which is attributed to a reduction in estimated maintenance requirements (P. 133). How are you able to reduce maintenance requirements.

Answer: Maintenance requirements at NPR-3 have been reduced due to successful application of a chemical treatment program. The chemical treatment program prevents scale buildup in downhole equipment and plugging of production perforations, reducing the number of down wells and maintenance requirements. Prior to this program, down wells averaged 40-80 wells at any given time. This has been reduced to an average of 10 down wells with the chemical program. This represents a decrease of approximately 15% in the number of producible wells down at a given time.

## Oil Shale Environmental Problems

Question: During FY 1982 you are to complete the Pre-Development program on the Naval Oil Shale Reserves. What are the major environmental problems likely to be encountered if the Naval Oil Shale Reserves were to be developed?

Answer: Through the extensive pre-development program which we have carried out for the Naval Oil Shale Reserves (NOSR) in Colorado, we have developed information on the existing environmental and socioeconomic baseline conditions for the Reserves and nearby areas. We have also analyzed a number of environmental subject areas which may be impacted by NOSR development, or by the combined effects of NOSR development and the activities of other oil shale and energy projects in the Piceance Basin region. Of particular concern are the cumulative socioeconomic impacts of energy development in the region, the "boom town" problem we hear so much about today. There may also be adverse impacts on air and water quality, and the availability of the large amounts of water necessary for producing the shale oil and disposing of the spent shale is also a potential problem area. We should like to mention a number of important points, however. First, when viewed from the perspective of the total number of energy development projects actually being built or projected for the region, the NOSR's are not a major source of impacts. Second, there is still much to be learned about many of the potential environmental problem areas, since the industry is still a year away from operation of the first full scale shale oil project. Finally, and perhaps most importantly, we are in close contact with the Department of the Interior and the many private commercial firms engaged in shale oil development work, to ensure that our studies and analysis efforts are reasonably coordinated with the work being carried out by these other organizations. From all of the information we have developed up to this time, we do not believe that the development of NOSR-1 poses any insurmountable difficulties in mitigating, to acceptable levels, any of the environmental or socioeconomic problem areas we have studied. The solutions may not necessarily be inexpensive or easy ones, but we do believe that they are achievable.

## Personnel

Question: The table on p. 124 of the justification shows outlays associated with the Naval Petroleum and Oil Shale Reserves. What was the cost outlay adjustment of $49,457,000 in FY 1981?

Answer: The FY 1981 cost outlay adjustment of $49,457,000 represents the difference between cost estimates made during FY 1981 and outlays for the entire FY 1981 Energy Production Demonstration and Distribution account. As such, it represents no more than an adjusting accounting entry to reconcile the Department's cost-based program accounting system with the outlays for the entire appropriation.

Question: Does that adjustment reflect a delay in the program in FY 1981?

Answer: The adjustment does not reflect a delay in the FY 1981 program since it represents an accounting entry to reconcile the difference between estimated costs and outlays. Overall, the NPOSR achieved its major goals.

## Emergency Preparedness Organizational Arrangement

Question: There has been a significant reordering of emergency preparedness functions in the Department of Energy. Please review for the Committee the functions now funded under the emergency preparedness request, where those functions were housed and funded previously and what functions are no longer being carried out.

Answer: A significant reordering of energy emergency preparedness functions has occurred within the Department of Energy. Fiscal Year 1982 activities represent the consolidation and integration of the Emergency Energy Conservation (CE), Oil Supply Security (PPA), Emergency Coordination (DP), Power Supply and Reliability (ERA), and Emergency Preparedness (ERA) programs within the Office of Energy Emergencies, Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness. The consolidation and integration of these programs result in a centralized emergency preparedness program with two main parts: Emergency Planning and Emergency Operations.

Beginning with Fiscal Year 1982, the Emergency Preparedness Program has abandoned the policy of extensive Federal intervention proven ineffective in previous supply disruptions, such as oil allocation, price controls and mandatory demand restraint measures, because they created or exacerbated the adverse economic and social impacts. Our program now emphasizes market reliance, coupled with private sector, self-help and voluntary action, liaison programs, and public and private stockpiles. The Fiscal Year 1983 Congressional Budget Request continues this approach.

## Emergency Authorities

Question: Under your emergency preparedness program, "government action could be expected only in response to extremely severe energy supply interruptions." (p. 75) What are your present authorities to respond to an emergency?

Answer: Our present authorities to respond to energy emergencies include:

Sections 202 and 251 of the Energy Policy and Conservation Act of 1975 (P.L. 94-163) authorize the United States to meet its obligations under the International Energy Agency and to restrict the public and private use of energy. The Emergency Energy Conservation Act of 1979 (P.L. 96-102) authorizes restrictions on the end-use of energy. The Defense Production Act of 1950 (P.L. 81-774, 50 U.S.C. App. 2061, et seq.) provides authority to allocate oil supplies for national defense purposes should it become necessary during a major disruption. Executive Order 11490, as amended, assigns emergency preparedness functions to Federal agencies dealing with petroleum, natural gas, solid fuels, and electric power. Section 404 of the Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) and the waiver authority under section 110(f) of the Clean Air Act Amendments of 1977 (P.L. 95-95, 42 U.S.C. 7410) encourage fuel switching and increased efficiency in fuel use.

Section 202 of the Federal Power Act (16 U.S.C. 792 et seq.), provides an additional legislative mandate to deal with electricity-related emergencies, such as issuing orders for emergency interconnections and developing electricity emergency plans. Section 232(b) of the Trade Expansion Act of 1962 (P.L. 87-794) provides authority to impose fees and quotas on oil imports based upon findings that oil imports threaten national security. Sections 301 to 304 of the Natural Gas Policy Act of 1978 (P.L. 95-621) provide emergency authority related to natural gas supplies during a severe shortage. Section 607 of the Public Utility Regulatory Policies Act of 1978 (P.L. 95-617) provides authority to prohibit the burning of natural gas by any electric powerplant or major fuel-burning installation. Authority also exists under the International Emergency Economic Power Act of 1978 (P.L. 95-223) to declare a national emergency to deal with any unusual and extraordinary threat to the national security, foreign policy, or economy of the United States.

Section 161 of the Energy Policy and Conservation Act of 1975 (P.L. 94-163) provides for draw down and distribution of the SPR oil during a severe supply interruption, and a plan for such distribution was approved by Congress in 1979.

During a severe interruption, if there is a need to have NPR surge production the President can ask the Congress for such authority.

## FY 82 Program

Question: During FY 1982 you expect to complete a study of the financial and economic impacts of energy supply disruptions, including identification of market enhancement measures. What market enhancement measures is the study examining?

Answer: Our analysis of market enhancement will examine several areas:

- State and local standby laws and regulations which may impede market forces.
- Insufficient information available to decisionmakers during oil crises which could lead to some inefficient use of resources.
- Contractual obligations of firms such as refiners. Such obligations could impede market forces in responding to a sudden shortfall.
- Ways to recycle oil revenues from higher energy prices in order to minimize adverse economic impacts, assure continuation of essential government services and functions and help the needy adjust to higher prices.
- Private stockpiles.

## Emergency Executive Reserves

Question: You have under development an Emergency Executive Reserve Program. Can you please explain to the Committee what the Emergency Executive Reserve Program is? .

Answer: The Emergency Reserve Programs include three separate, but interrelated National Defense Executive Reserve units:

-- Emergency Electric Power Administration (EEPA)

-- Emergency Petroleum and Gas Administration (EPGA)

-- Emergency Solid Fuels Administration (ESFA)

These executive reserve units, authorized under the Defense Production Act of 1950 (DPA), were designed to monitor and, if necessary, direct the operations of the electric power, petroleum and gas, and solid fuels (coal/coke) industries during conventional or nuclear war, or in response to significant threats to the Nation's security. DOE believes that it would be useful to revitalize these units by instituting and maintaining suitable recruitment, training and administrative programs. From 1977 (when the units were transferred to DOE from the Department of the Interior) until recently, these units were dormant. In FY 1982 and FY 1983 we will revitalize them and bring each to a state of adequate preparedness.

We anticipate that during FY 1982 and FY 1983 we will accomplish t' following:

-- Hold workshops to examine and resolve key issues.
-- Complete reorganizing and restaffing EEPA, EPGA and ESFA.
-- Revise and distribute operating handbooks for each Reserve.
-- Train reservists regionally.
-- Conduct individual unit and joint field exercises.

## Emergency Communications and Operations

Question: You also plan to establish facilities to coordinate communications and operations during energy emergencies, including direct interconnections with State and local energy offices. What facilities do you plan to establish?

Answer: We are examining energy emergency operations communications and facilities within the Department of Energy. This examination includes facilities available to the Emergency Preparedness Program which could be required under various severe energy emergency scenarios. Additionally we are reviewing utilization of communications hardware for communications during an energy emergency with the states and other Federal agencies. The outcome of this review will be an action plan to upgrade such facilities and communications hardware, as appropriate, to enhance the accomplishment of our emergency preparedness mission.

Question: What are the costs involved in FY 1982? How much is budgeted for FY 1983?

Answer: We anticipate possible expenditure of $500,000 in Fiscal Year 1982 for necessary hardware and facilities upgrading, with $350,000 allocated in Fiscal Year 1983 to continue such improvements.

### FY 82 Objectives

Question: In comments on a GAO report the Department states, "It is DOE's position that the Federal Government should provide leadership promoting greater public understanding of the need for energy emergency preparedness." How is this reflected in the budget request?

Answer: No funds are specifically earmarked for promoting greater public understanding of the need for energy emergency preparedness because the level of such support represented by staff and salary commitments at this time is adequate to the task. Additionally, we are exploring new collaborative arrangements with industry and the possibility of establishing standing working groups with such organizations as the National Governors' Association for their promise of reaching out to the public more effectively, and at less direct Federal cost.

The Office of Energy Emergencies is developing an Interim Emergency Public Information Plan which sets forth internal (and eventually inter-agency) procedures for communicating information to the public on the dimensions of any energy emergency and steps to foster free market and individual adjustments. Toward that end, this plan will recommend ways to use State, local, and private organizations to disseminate accurate information. A final plan is scheduled for completion in September 1982, and we consider resources adequate for this effort. If additional funds are required, these will likely be small, and can be drawn from current resources.

## Power Supply and Reliability Activities

Question: You are reducing support for power supply and reliability activities. What is to be eliminated?

Answer: We will continue all power supply and reliability activities as required under the Federal Power Act and other authorities. However, based upon a careful review of the activities which were conducted in prior years, and applying the policy of the Administration to refrain from interfering in energy activities which are best left to the private sector, a number of program changes were made which are reflected in the Fiscal Year 1983 budget.

Working with the electric utility industry, we have reduced our data collection efforts, eliminated certain items on several forms, and scaled down our publishing of various reports and data summaries. Much of this is now being done by the industry itself. Additionally, we are phasing out many of the routine electric utility activities not directly connected with emergency preparedness. Thus, we are reducing our involvement in electric energy brokering arrangements, incentives for cogeneration interconnections, development of computer systems to analyze electric system interchanges, and PURPA activities involving innovative rate design and related issues. We are also discontinuing projects relating to quality of fuel for electric plants, and similar projects studying maintenance of powerplants, all of which are routine operational issues which are outside the basic mission of this Office.

Question: How many field positions are being eliminated? Are you terminating the work these field people were doing or are you going to do it a different way?

Answer: Regarding the Power Supply and Reliability Program field offices, we have begun to transfer functions previously performed in these field offices to headquarters. All field office employees have been offered the opportunity to transfer to Washington, D.C. We expect to complete the transfer of functions during Fiscal Year 1982.

## SPR Drawdown Requirements

Question: How does the test of SPRO drawdown procedures described in the emergency preparedness justification (p. 80) differ from what is justified in the SPRO planning request? (p. 58)

Answer: The DOE budget justification covering emergency planning activities (on page 80) differs from the justification for SPR planning activities (on page 58) in that the focus of those for SPR are on operating aspects of the program, including the mechanical, logistical, safety, security, and maintenance functions. Those for emergency preparedness concern planning activities, including such critical management functions as developing the process by which there would be a decision to use the SPR, and developing shortage scenarios and alternative strategies to use SPR resources. These are separate activities involving strategic planning and functional operating procedures.

The test to which the justification refers is one of a series which must occur before the DOE can be certain that all decisionmaking and operating components of the SPR will prove adequate to responding rapidly to an energy emergency. There have already been tests of the on-site operating aspects of the system, and, following the completion of an approved SPR Distribution Management Manual, a test of the decisionmaking process will occur in the Fall of 1982 ("Phase B exercise"). The tested components are distinctive elements of an overall system.

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WEDNESDAY, APRIL 21, 1982.

## CONSERVATION AND RENEWABLE ENERGY

### WITNESSES

**JOSEPH J. TRIBBLE, ASSISTANT SECRETARY, CONSERVATION AND RENEWABLE ENERGY**

**MAXINE SAVITZ, DEPUTY ASSISTANT SECRETARY FOR CONSERVATION AND RENEWABLE ENERGY**

**MELVIN CHIOGIOJI, DIRECTOR, OFFICE OF STATE AND LOCAL ASSISTANCE PROGRAMS**

**JOHN J. BROGAN, DIRECTOR, OFFICE OF ENERGY SYSTEMS**

**HENRY L. STADLER, DIRECTOR, OFFICE OF TRANSPORTATION PROGRAMS**

**ALAN J. STREB, DIRECTOR, DIVISION OF INDUSTRIAL CONSERVATION RESEARCH AND DEVELOPMENT**

### OPENING REMARKS

Mr. YATES. Show the hearing as coming to order.

This is the hearing on the 1983 appropriation for Conservation and Renewable Energy of the Department of Energy.

Appearing in support of that appropriation is Mr. Joseph Tribble, Assistant Secretary for Conservation and Renewable Energy; Maxine Savitz, Deputy Assistant Secretary for Conservation and Renewable Energy; Robert San Martin, Deputy Assistant Secretary for Conservation and Renewable Energy; and Melvin Chiogioji, Director of the Office of State and Local Assistance Programs. The biographies of Mr. Tribble, Dr. Savitz, Dr. San Martin and Dr. Chiogioji—all doctors—may be made a part of the record.

How did you escape being a doctor, Mr. Tribble?

Mr. TRIBBLE. I guess I am older than the rest of these people.

Mr. YATES. I see.

Mr. TRIBBLE. I came along in the depression years. It was not that easy.

Mr. YATES. At any rate, your statement may be made a part of the record.

[The biographies and the statement of Joseph Tribble follow:]

**U.S. Department of Energy**
**Assistant Secretary for**
**Congressional, Intergovernmental**
**and Public Affairs**
**Office of Public Affairs**
**Washington, D.C. 20585**
**202/252-5644**

# BIOGRAPHY

## JOSEPH J. TRIBBLE

Joseph J. Tribble was confirmed Assistant Secretary for Conservation and Renewable Energy, U.S. Department of Energy (DOE) on May 14, 1981.

Prior to his current appointment, Mr. Tribble was Energy Coordinator for the Unbleached Division of Union Camp Corporation. In that position, he was responsible for energy management for the firm's unbleached paper mills in Montgomery, Alabama; Monroe, Michigan; and in Savannah, Georgia. He previously held positions as assistant power plant superintendent and power plant superintendent, in the Savannah Mill which has the largest and most complex power plant in the industry and where several pioneering steps have been taken in energy utilization.

The primary objective of the Corporation's energy management program, to reduce the consumption of fossil fuels, has been achieved most notably at the Savannah plant, where fuel use per unit of production was reduced by 40 percent between 1972 and 1980. The overall success of the firm's energy management program has been attributed to a combination of measures, including increased use of energy-saving equipment, and increasing the amount of wood waste in the total fuel mix.

Mr. Tribble received a B.S. degree in mechanical engineering from Georgia Institute of Technology in 1942. From February 1942 to August 1943, he was with Bethlehem Steel Company, Bethlehem, Pennsylvania. He served with the U.S. Maritime Service from 1943 to 1946.

Mr. Tribble has been an active leader in the Republican Party since 1960, serving one term as State Chairman of the Republican Party of Georgia and two terms as State Senator (the first Republican State Senator from southeast Georgia in this century). He was a Delegate, Member of the Platform Committee, and Member of the Energy Subcommittee of the Republican National Conventions of 1976 and 1980. He was Chairman of the 1980 Reagan for President Campaign in the First Congressional District of Georgia.

A native of Forsyth, Georgia, Mr. Tribble is married to the former Laura Boddiford of Sylvania, Georgia. They have four children. At the time of his appointment he was serving as Chairman of the Administration Board of the Wesley Monumental United Methodist Church in Savannah.

U.S. Department of Energy
Assistant Secretary for
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and Public Affairs
Office of Public Affairs
Washington, D.C. 20585
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# BIOGRAPHY

## DR. MAXINE SAVITZ

Dr. Maxine Savitz was named Deputy Assistant Secretary for Conservation, Office of Conservation and Renewable Energy, U.S. Department of Energy (DOE), in February 1980. In this position, she directs programs designed to improve energy efficiency in transportation, buildings, and industry. Her office also administers a basic research program which includes heat transfer and themodymanics.

Previously, Dr. Savitz served as DOE's Deputy Assistant Secretary for Conservation and Solar Applications, providing administrative and management support to the Assistant Secretary. In addition, she served as Director of the Division of Buildings and Community Systems, Office of Conservation and Solar Applications.

She held similar positions with the U.S. Energy Research and Development Administration (ERDA), which was merged into DOE in October 1977. Before joining ERDA in 1975, she was Director of the Building Policy Research Program, Office of Energy Conservation and Environment, at the Federal Energy Administration (FEA). Prior to that assignment she was a Program Manager at the National Science Foundation. Earlier, she served as Professor of Chemistry at Federal City College where she was the creator and co-principal investigator of the Federal City College Science Mobile. She has served also as Chemisty/Laboratory Instructor at Hunter College in New York.

Dr. Savitz graduated from Bryn Mawr College, magna cum laude with honors in chemistry, in 1958. She was awarded a Ph.D. degree in organic chemistry by M.I.T. in 1961 and was a post doctoral fellow at the University of California, Berkeley, California.

In 1967, Dr. Savitz received the MERDC Commander Award for Scientific Excellence at Fort Belvoir, Virginia, where she was a senior research chemist working in the area of hydrocarbon fuel cells and secondary batteries.

Dr. Savitz recieved the DOE Oustanding Medal in 1981, the President's Meritous Rank Award in 1980 and several other awards at DOE, ERDA, and FEA. In 1975, she received the FEA Certificate of Superior Service. She was recognized for her outstanding contribution to the construction industry in 1975 and 1979 by the Engineering News Record.

Currently, Dr. Savitz serves as editor of Energy & Buildings, Elsevier Publications. She is a member of the Advisory Board, Buildings Research Advisory Board.

A native of Baltimore, Maryland, Dr. Savitz presently resides in Washington, D.C. with her husband and two children.

## DR. ROBERT L. SAN MARTIN

Dr. Robert L. San Martin has served as Deputy Assistant Secretary for Renewable Energy, Office of Conservation and Renewable Energy, U.S. Department of Energy (DOE), since February 1981. In this position he is responsible for the management of the Department's renewable energy research, development, and proof of concept programs. His primary duties include the formulation and implementation of DOE policies which relate to the development of renewable energy technologies.

Dr. San Martin joined the Department of Energy in 1978 as Director of DOE's Division of Distributed Solar Technology. He then served as Deputy Assistant Secretary for Field Operations and International Programs in the Office of Conservation and Solar Energy where he managed the relationship between the Office of the Assistant Secretary and DOE laboratories and field installations. In October 1980, he was appointed Deputy Assistant Secretary for Solar Energy in the Office of Conservation and Solar Energy, where he was reponsible for managing the Department's solar energy research development, demonstration and commercialization programs.

Dr. San Martin's extensive career in the area of solar energy began at the University of Florida where he received his bachelor's degree in mechanical engineering in 1963, his master's in 1964 and his doctoral degree in 1969. He then continued his career at New Mexico State University, teaching and performing research in solar energy, heat transfer, and thermodynamics. In 1974 he became Director of the Energy Research and Development Institute at New Mexico State University.

From 1977-78, he served as Director of the New Mexico Solar Energy Institute and, from 1976-78, was Director of the New Mexico Energy Institute where he assumed responsibility for solar and geothermal energy research in the state.

A member of numerous solar professional and technical societies, he is past chairman of the American Society of Mechanical Engineers Solar Division and currently a member of the Board of Directors of the American Section of the International Solar Energy Society. He is author or co-author of over 50 technical publications and reports on solar energy.

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# BIOGRAPHY

## DR. MELVIN H. CHIOGIOJI

Dr. Melvin H. Chiogioji is Deputy Assistant Secretary for State and Local Assistance Programs, Office of Conservation and Solar Energy, U.S. Department of Energy (DOE). He directs grant programs for states and localities, including the institutional buildings conservation grants program and the residential conservation service, and is responsible for the small scale technology and energy-related inventions programs.

Previously, Dr. Chiogioji was director of the Federal programs division and assistant director for systems analysis in DOE's Division of Buildings and Community Systems, also part of the department's conservation and solar energy program.

Dr. Chiogioji held similar positions with the Federal Energy Administration (FEA) since 1975. From 1973 to 1975, he served as director of FEA's Office of Industrial Analysis, Industrial Programs Office. FEA became part of DOE in 1977.

During the period 1965 through 1973, Dr. Chiogioji held key civilian posts with the Navy ranging from engineering positions with the Phoenix missile program to director of the Weapons Evaluation Division, Naval Ordnance Systems Command.

Dr. Chiogioji served as a naval officer from 1961 to 1967, including a one-year tour of duty as the Navy officer in charge at the Byrd Station in Antartica.

Born in Hiroshima, Japan, in 1939, he attended Purdue University and received his bachelor of science degree in electrical engineering in 1961. He received a master of business administration degree in management from the University of Hawaii in 1968, and his doctorate in operations research and R&D management from George Washington University in 1972. He is a professorial lecturer of management science at George Washington University and a registered professional electrical engineer.

Dr. Chiogioji has been listed in various publications including Outstanding Young Men of America; Community Leaders of America; Personalities of the West and Midwest; Men of Achievement; Who's Who in Finance and Industry; Who's Who in the East; and American Men and Women in Science. He is the author of two books, Industrial Energy Conservation, 1979, and Residential and Commercial Buildings Energy Conservation, 1980, and many monographs and articles.

He resides with his wife and two children in Silver Spring, Maryland.

# STATEMENT OF JOSEPH J. TRIBBLE
ASSISTANT SECRETARY
for
CONSERVATION AND RENEWABLE ENERGY
DEPARTMENT OF ENERGY

FY 1983 APPROPRIATIONS HEARINGS
before the

HOUSE APPROPRIATIONS COMMITTEE
SUBCOMMITTEE ON INTERIOR AND RELATED AGENCIES

April 21, 1982

Mr. Chairman and Members of the Subcommittee:

I appreciate this opportunity to appear before you today to discuss the budget request for the Department's conservation program. The budget before you today reflects this Administration's commitment to the goals of the Economic Recovery Program, the need to minimize Government intervention in the marketplace, and the need to continue Federal support for research in areas where such support is appropriate.

In testimony before various Authorization Committees this year, the Congress has expressed a general dissatisfaction with the amount of reduction in proposed expenditures for FY 1983 as compared to FY 1982. Indeed, some persons have stated that we will undoubtedly have more money appropriated than we have requested. The Appropriations Committees will, of course, make that determination.

There are rational reasons for the substantial reduction which we will attempt to explain. In this testimony we have also made an effort to explain in some detail what we would expect to accomplish with the level of funding requested.

Conservation of energy, if we define it as the more efficient utilization of energy, is a goal we should pursue in our own economic self interest both in government and in the private sector. The cost of energy provides incentive for its wise use, and generally the "know-how" is available. The buildings, vehicles, and industrial processes in use in 1973 were energy-inefficient but not because we did not know how to build them to be energy-efficient. It was an economic matter. Energy was cheap. It simply was not good business to invest in energy conserving measures which would never recover their cost.

Now that energy is more costly, it is being used more efficiently. For example, comparing 1980 with 1972, the energy efficiency of the ten most energy-intensive industries in the United States has improved by 17.6 percent. Virtually all of this improvement was accomplished by the application of technology that has been known for years. The point here is that there is little linkage between Federal dollars spent on conservation research and the actual conservation that is taking place.

A second reason for reducing Federal dollars spent on conservation is the following. Much of the money in the high-level budgets of former years was spent on expensive hardware. Many millions have been spent on developing electric vehicles. We have a fleet of almost a thousand being tested now. We have learned that the key element in this development is the battery. Before more vehicles are purchased in this program, we need to develop a suitable battery. We are thus requesting funds to do this work. Many millions have been spent on developing an automotive gas turbine. It has reached the point where only ceramic parts will improve its efficiency. Thus we are requesting funds for ceramic research.

Many millions have been spent developing a Stirling engine for automotive use. Chances of success are remote. No major automobile manufacturer is interested. The program should be terminated.

There is still a third reason for reducing the size of this budget. The building industry is a very fragmented industry. Although there has been little research done to assist in building more energy efficient buildings, the work which has been done in the Conservation program and in the passive solar program has done much to satisfy this need.

The cost per researcher is around $100,000 per year. On this basis, our FY 83 request will support roughly 175 researchers. In these times when every dollar we spend must be borrowed at current high interest rates and added to the Federal deficit, we believe this request is adequate.

We propose to redirect our research away from end use products toward more general research with a wide application.

Following is a discussion on what we expect to do with the funding we have requested.

## CONSERVATION RESEARCH

In the area of conservation, we will focus on expanding our scientific knowledge base by supporting generic high-risk, long-term, research in selected technological areas. This new focus is reflected in the consolidation of our previous sector-oriented programs into a single Energy Conservation Research Program.

The basic objective of this program is to provide the technology base and technology options that the private sector can utilize in the development of more efficient energy conservation equipment and utilization processes. This program will solidify the technology base used by the private sector in designing the developing processes and equipment in their application to the transportation, buildings and industrial energy-use sectors.

The FY 1983 request for Energy Conservation Research is $17.5 million, which includes $1.7 million for program direction. This request will fund research activities in four research areas: heat transfer and fluid mechanics, materials and processes, thermochemical conversion, electrochemical storage and conversion. Activities in each element focus on research topics having high potential for improving energy use efficiency.

## Heat Transfer and Fluid Mechanics

The request for Heat Transfer and Fluid Mechanics research is $3.2 million, which will support technology base activities underlying the design of heat exchangers and fundamental studies of heat loss in structures and industrial equipment. Research will also focus on generic properties of fluids and fluid systems that affect the efficiency of operation of power systems such as advanced heat engines and heat pumps.

In FY 1983, heat exchanger activities will build on earlier efforts that resulted in an integrated, computerized data base and model system for the prediction of flow induced vibration. Research will focus on the modeling mechanism of flow induced vibration in shell-and-tube heat exchangers caused by two-phase (steam/water) flow, and on innovative concepts such as suspended particle and direct contact heat exchanger concepts.

Heat Transfer research activities directed at structures will focus on wall and roof systems, windows and daylighting, computer modeling enhancements and estimating methods.

In wall and roof systems research, data collected from extensive test cell measurement will be used to analyze the effect of temperature set-back, windows and doors, and building mass. Dynamic performance research will complete analyses of moisture migration and condensation, thermal performance, and air/moisture transfer in wall sections using a calibrated hot box at the National Bureau of Standards.

Research on windows and daylighting will work with physical and computational models in order to continue development and cross-validation of predictive illuminance, thermal, and energy consumption models for analysis of geometrically complex window design, sun control systems, and spaces for variable filtering devices. Climatological studies will continue to support the effort on illuminance availability. In the area of performance, studies on mobile daylighting and thermal test cells will be completed. Validation tests in the field will be initiated on natural illumination, net through-fenestration energy flow measurement, and net room energy-use impact. Estimating methods will focus on the greatest common denominator to complete transient heat transfer, fluid flow, and mechanical systems response modeling in the DOE-2 computer simulation program.

Materials and Processes

The major thrust in materials research will be directed toward high temperature structural ceramics. While major advancements have been achieved in shape, fabrication and material strengths of structural ceramics, e.g., advanced gas turbine rotors have been cold spun to 126 percent and 134 percent of design speed with no failure, significant technological advances are needed in order for heat engines to operate more efficiently in severe environments.

Funding of $2.99 million will be directed at advanced materials development and processing, advanced net-shape materials fabrication, and new approaches to assuring structural integrity of advanced materials. Research would also be carried out on evaluation of critical properties of newly developed materials and determination of the interrelationship between newly developed processes, associated microstructure and properties.

Several projects will be devoted to advanced materials development of: high-temperature ceramic/ceramic composites, ceramic matrix/metal fiber reinforced composites, a new family of transformation-toughened ceramics, and new thermal barrier materials. The goal is to develop composites that are low in cost and have low thermal expansion and conductivity coefficients. These materials will be able to withstand high temperatures, have moderate to high strength, and have high fracture toughness. Property evaluations will be made of friction and wear of ceramics and metals for high load environments. Newly developed ceramics will be subjected to screening tests, including thermal fatigue to examine their time-temperature-stress behavior. Promising candidate materials (fabricated in realistic shapes) will be tested in realistic environmental exposures.

Other materials research activities will focus on indoor air quality and gas isotope enrichment for discharge lighting. In the indoor air quality research, work will be performed on minimum air changes to determine transport phenomena (spatial distribution). The analysis of potential control techniques will be completed. This will build on earlier advancements including development of a simplified device that would allow large scale measurement of air infiltration of buildings to be made at 1-2 percent of the cost of current techniques.

Chemical process research initiated in FY 1982 to study biocatalyzed production of bulk chemicals, such as nitrogen fertilizer and ethylene feedstock, will be continued. Emphasis will be on techniques to preserve the catalytic activity and increase the lifetime of enzyme catalysts under projected reaction conditions.

Thermochemical Energy Conversion

The objectives of the thermochemical energy conversion are to develop accurate and reliable methods for industry use in designing components for more efficient internal combustion engines and methods for use in designing more efficient commercial and industrial furnaces. Advances have been made in addressing such technological barriers as our current incomplete understanding of engine and furnace combustion phenomena and lack of technology base. Since 1981 DOE has successfully adopted laser-based instruments to measure phenomena in internal combustion engines and developed computer models to analyze intake, fuel preparation, and exhaust processes in internal combustion engines.

FY 1983 funding of $2.37 million will support improved design and analysis capabilities for operation at reduced fuel-air ratios. Engine cycles to be included are direct-injection stratified charge (DISC) and dilute homogeneous charge (DHC).

In FY 1983, research on high-efficiency energy-conversion equipment (home heating equipment) will continue to develop the fundamental understanding of thermodynamic properties, the kinetic properties, and materials and fabrications associated with the coupling of small heat engines to freon compressors. Planned milestones for FY 1982 will result in the development and testing of a dynamic coupling/seal for novel engine freon compressor systems. Successful coupling techniques could lead to industry's development of gas-fired, engine-driven residential heat pumps, capable of operating at two times the efficiency of standard electric air to air heat pumps. Work will also be completed on the analysis of novel materials and material designs that could be utilized in the design of heat exchangers for use in residential-sized, condensing-mode heating systems. This work includes analyzing condensate composition of the waste gas stream of conventional heat exchangers.

Electrochemical Storage and Conversion

The objective of the electrochemical storage and conversion activities will be directed at the fundamental understanding of thermodynamics, kinetics, electrocatalysis, mass transport, and materials synthesis and fabrication as they relate to batteries and electrochemical processes and energy conversion. Anticipated milestones for FY 1982 will result in an advanced alternating current propulsion system for an electric vehicle that permits a 50 percent reduction in cost and weight over existing systems. Industry may find many ultimate uses for the results of this research in the development of new technologies such as batteries in automobile propulsion, utility, and residential load leveling.

The FY 1983 request of $7.22 million will fund research on new active and passive cell materials for rechargeable cells offering much higher performances and cycle life at reasonable costs, generic problems of existing rechargeable storage battery systems, and electrochemical conversion systems. We will also investigate the characteristic of existing electrode systems, ionic conductors for batteries with special emphasis on nonaqueous fluid electrodes and characterization of ion selective membranes and separators.

Information and Regulatory Programs

No funds are being requested in FY 1983 for Information and Regulatory Programs including Residential Conservation Service, Appliance Standards, Buildings Energy Performance Standards, Federal Energy Management Programs, Gas Mileage Guides and Industrial Reporting. Although the Administration believes the regulatory and information programs should be terminated, DOE is continuing to work on those statutory responsibilities to the extent that they have been funded by the Congress. Proposed amendments to the regulations for the Residential Conservation Service were published November 3, 1981, in the Federal Register, for public comment. These amendments, when issued as final regulations, would eliminate much of the burden associated with compliance by the utility sector. A notice of Proposed Rulemaking regarding energy efficiency standards for household appliances was published April 2, 1982 in the Federal Register for public comment. Work is underway on the Buildings Energy Performance Standards in preparation for issuance of interim standards. This research is not yet completed, due to rescission/deferral of FY 1981 program funds by the Congress, at the Adminis-tration's request. The FEMP program is currently completing a government-wide 10-year energy efficiency plan, reviewing agency buildings and operations plans, developing the life-cycle-cost rule, and preparing annual reports to Congress. The Annual Industrial Energy Efficiency Report covering progress toward 1980 energy-efficiency targets is being completed.

## CONSERVATION GRANTS

The Office of State and Local Programs is responsible for administering the Conservation Grants program including grants, providing technical assistance, and offering guidance on energy conservation to State Energy Offices, local governments, small businesses and individuals. The programs administered by this office are the Schools and Hospitals Grants Program; the Weatherization Assistance Program; the Energy Extension Service; the State Energy Conservation Programs; the Energy-Related Inventions Program; and the Appropriate Technology Program. The FY 83 request for Energy Conservation Grants is $4.3 million for program direction. I would like to briefly describe the current status of these program activities.

### Schools and Hospitals Grants Program

The Institutional Conservation Program is designed to subsidize conservation measures for local governments and local public and nonprofit institutions. Under the National Energy Conservation Policy Act (NECPA), Title III, Parts 1 and 2, the Department provides both technical and financial assistance to public and nonprofit schools, hospitals, local government and public care institutions. The specific goals and objectives for FY 1982 are:

- Allocate the $48 million appropriated for FY 1982 and award grants for energy conservation activities.
- Complete the national evaluation of the grants program.
- Conduct joint public/private efforts to explore alternatives to Federal financial assistance to support energy conservation and disseminate information as appropriate.

- Prepare for close-out of the Schools and Hospitals Grants Program.

The FY 1983 budget requests no funding for the Schools and Hospitals Grants Program and plans are needed so that the program can be closed out in FY 1983.

Weatherization Assistance for Low-Income Persons

The weatherization program provides for the installation of energy conserving measures such as caulking, weatherstripping, attic insulation and storm windows to reduce heat loss and conserve energy in the homes of low-income people. Particular emphasis is given to the low-income elderly and handicapped. DOE has provided grants to 50 States, the District of Columbia and 25 Native American tribal organizations.

DOE's Weatherization Assistance Program awarded its first grant in August 1977. By our estimate, as of December 1981, more than 800,000 homes had been weatherized under the DOE program.

The President's FY 1983 budget requests no funding from DOE for Weatherization Assistance Program. The FY 1983 Budget does provide Federal funds to the States for weatherization through the Low-Income Home Energy Assistance Program (LIHEAP), administered by the Department of Health and Human Services (HHS), and through the Community Development Block Grant Program, administered by the Department of Housing and Urban Development (HUD). Up to 15 percent of the LIHEAP funds are authorized to be allocated by States for weatherization activities.

## Energy Extension Service

The Energy Extension Service was designed to provide direct personalized information and technical assistance to small-scale energy users such as small businesses and homeowners who individually use small amounts of energy but, in aggregate, use roughly 40 percent of the Nation's supply, to assist them in using energy more efficiently including appropriate uses of renewable resources. The Energy Extension Service Program has served to establish energy offices in the States, and to assist States in the start-up and initial development of conservation and renewable resource activities aimed at addressing those energy issues specific to a given State. As States have become increasingly able to develop and implement such activities, there is a lessening need for Federal assistance.

The FY 1983 Budget request does not therefore propose funding for the Energy Extension Service.

## State Energy Conservation Program

The State Energy Conservation Program (SECP) was designed to provide States with the means to establish and implement energy conservation programs with the goal of reducing State energy consumption. The specific goals and objectives for FY 1982 are to:

- Provide 57 grants to States and territories in an expeditious fashion for funding of SECP activities.
- Prepare for FY 1983 categorical grant closeout, and
- Provide assistance to States to build capability for continuation of their most beneficial programs without Federal funds.

The State Energy Conservation Program in addition to the Energy Extension Service Program has served to establish energy offices in the States, and to assist States in the start-up and initial development of conservation and renewable resource activities aimed at addressing those energy issues specific to a given State. States are now aware of how to implement such activities, and can do so as their priorities for funding permit. The FY 1983 Budget request does not therefore propose additional Federal funding for this program.

## Energy-Related Inventions Program

The Energy-Related Inventions Program was established to evaluate the technical merits of energy-related inventions submitted. The National Bureau of Standards (NBS) has evaluated approximately 17,500 energy-saving inventions. Based on NBS recommendations, 114, or one in 1500, inventions have been awarded grants at a cost of approximately $8.4 million for an average grant of about $78,000. In view of this low success ratio and the incentives to innovate engendered by realistic energy prices, no FY 1983 funds are requested for this program.

## Appropriate Technology Program

"Appropriate technology" refers to decentralized systems for producing or applying energy that are matched in scale and nature to local needs and resources. Since Fiscal Year 1978, the program's first year, the Department of Energy has evaluated nearly 45,000 proposals, selecting about 2,400 (5 percent) for funding at a total cost of $28 million. The average grant was about $12,000. Approximately 20 publications were released and about 50 workshops conducted to encourage the initiation of successful projects. Thus, the program has met its objective of supporting the research, development, and demonstration of a great variety of small-scale, decentralized renewable energy technologies by providing financial assistance.

No funds have been requested for Fiscal Year 1983 or beyond. Fiscal Year 1981 was the last grant award cycle; however, since projects are funded at the end of the fiscal year for up to 24 months, some previously funded project activity will continue through Fiscal Year 1983.

Mr. Chairman, this concludes my formal statement. I would be pleased to respond to any questions.

Mr. TRIBBLE. Thank you.

Mr. YATES. Would you like to tell the committee how well your Department is doing?

### SUMMARY STATEMENT

Mr. TRIBBLE. I would like to summarize the testimony that is submitted for the record because there are several points that I think need to be made, particularly in view of the fact that this proposed budget is so substantially below the budgets that have been submitted in prior years.

In testimony before various Authorization Committees this year, the Congress has expressed a general dissatisfaction with the amount of reduction in proposed expenditures for fiscal year 1983, as compared to fiscal year 1982.

There are rational reasons for the substantial reduction which we will attempt to explain today. In this testimony, we have also made an effort to explain in some detail what we would expect to accomplish with the level of funding requested.

Conservation of energy, if we define it as the more efficient utilization of energy, is a goal we should pursue in our own economic self-interest both in Government and in the private sector. The cost of energy provides incentive for its wise use, and generally the "know-how" is available.

The buildings, vehicles, and industrial processes in use in 1973 were relatively energy-inefficient, but not because we did not know how to build them to be energy-efficient. It was an economic matter. Energy was inexpensive. It simply was not good business to invest in energy conserving measures which would never recover their cost.

Now that energy is more costly, it is being used more efficiently. For example, comparing 1980 with 1972, the energy efficiency of the ten most energy-intensive industries in the United States has improved by 17.6 percent. And this is per unit of production without reference to the level of economic activity.

Virtually all of this improvement was accomplished by the application of technology that has been known for years. The point here is that there is little linkage between Federal dollars spent on conservation research and the actual conservation that is taking place.

A second reason for reducing Federal dollars spent on conservation is the following: Much of the money in the high-level budgets of former years was spent on hardware. Many millions have been spent on developing electric vehicles. We have a fleet of almost 1,000 being tested now.

We have learned that the key element in this development is the battery. Before more vehicles are purchased in this program, we feel that we need to develop a suitable battery. We are thus requesting funds to do this work. Many millions have been spent on developing an automotive gas turbine. It has reached the point where only ceramic parts will improve its efficiency. Thus, we are requesting funds for ceramic research.

### STIRLING ENGINE

Many millions have been spent developing a Stirling engine for automotive use. We feel that chances of success are remote. No major automobile manufacturer is interested to the point of being willing to put forth any substantial dollars in this development.

Mr. Yates. Why is that?

Mr. Tribble. There are several reasons for that, for this posture. I would like to talk about a few of them.

In the first place, the Stirling engine is a capital intensive engine. Suppose you put it into an automobile and suppose you drive the automobile, assume that the chassis will last you 100,000 miles, and assume that it runs only 25 miles per hour, then the lifetime of the engine would be on the order of 4,000 hours.

It is generally not good design practice to put a capital intensive engine in something that is only going to be used for those few hours. A more reasonable use for a Stirling engine would be in an application where it might drive a compressor on a gasline, or in some use where it would be used many hours throughout a year.

In this way, you would spread the capital costs over a larger number of hours, and perhaps it would be a better application. There are other problems with the Stirling, such as its horsepower to weight ratio, or weight to horsepower ratio. Good strides have been made in reducing this weight, simply in trying to adapt it for transportation use.

Of course, this is not surprising because if you think about the old low-speed diesels and the changes that were needed when this was adapted to the diesel locomotives, I am sure that the weights were reduced in that instance.

We feel that the weight of the Stirling engine is a definite problem. However, in view of the fact that it does have some fuel flexibility, this is an advantage of it.

On the other hand, the major automobile companies, I think both Ford and General Motors, have in the past been active in attempting to develop the Stirling, and both have discarded it.

Mr. Yates. The information that the committee had was that at least Ford was interested. That is why we were a little taken aback by your statement that no major automobile manufacturer is interested in the Stirling.

Mr. TRIBBLE. I think the degree of interest is the key to the difference in the information that we have. It is my understanding that NASA went to the organization that is doing the developing of the Stirling engine and asked them if they knew of any automotive companies that were interested. And then they contacted those companies, and the response from Ford was that they would be interested in testing a Stirling engine in the event that one was successfully developed.

Mr. YATES. I see.

Mr. TRIBBLE. On the other hand, late yesterday afternoon we talked with the people at Ford Motor Company, and they indicated that that was the limit of their interest.

Mr. YATES. I see. Proceed.

### SUMMARY STATEMENT

Mr. TRIBBLE. There is still a third reason for reducing the size of this budget. The building industry is a very fragmented industry. Although there has been little research done to assist in building more energy efficient buildings, the work which has been done in the conservation program and in the passive solar program has done much to satisfy this need.

Later on in the hearing, we will be able to relate to you some of the work that is being done relative to the building energy performance standard guidelines and give you information on just what will be done in this area.

On a different thought, we generally ascribe a cost of $100,000 a year to a researcher. On this basis, the fiscal year 1983 request will support roughly 175 researchers in conservation research. We also consider that every dollar we spend must be borrowed now at the current high interest rates and added to the Federal deficit.

In view of these generalities that I have mentioned, we feel that this is a rational proposal that we are making. One other point: We propose to redirect the effort away from end-use products into more generic kinds of research that would be applicable to a wider part of industry. That concludes my summation, and we would be pleased to get into the question-answer session.

Mr. YATES. There is really a tremendous slice being taken out of your conservation research, isn't there?

Mr. TRIBBLE. Yes, there certainly is.

### REORGANIZATION OF DOE

Mr. YATES. Does this mean that the Department of Energy is being closed down? Is this one of the steps taken for that purpose?

Mr. TRIBBLE. We don't view it as that. Actually, this effort would be continued even if the reorganization were approved and this activity would be passed over to the Commerce Department.

Mr. YATES. Then the answer really to my question is yes? The Department of Energy would be closed down. You say it would be passed over to the Commerce Department. What would remain?

Mr. **Tribble**. What I was saying is that this work would move forward regardless of whether the Energy Department continues to exist or not.

### ATTRITION AT DOE

Mr. **Yates**. Well, Inside Energy is a publication put out by McGraw-Hill. In the April 16 issue, on page 8 it says this: "DOE has lost so many talented, senior-level officials through attrition—due in part to the planned dismantlement of the department—that it may be tough to continue programs at current levels of activity, even if Congress increases the energy budget substantially, William Heffelfinger, assistant secretary for management and administration, said last week. A 'self-destruct syndrome' is at work, with officials fearing the department will be dismantled and abandoning it now, Heffelfinger told ERAB. Those deserting DOE feel like lame ducks and fear for their future because of reorganization plans."

Would you like to comment on that? That is one of the reasons we think the Department of Energy is now a shambles, really, and that you are moving toward a relatively near-time paralysis.

Mr. **Tribble**. Well, I am sure that what is said there has had its effect. Even the reduction in the budgets that have taken place in prior years, from 1981 to 1982, the rescission of 1981, certainly those things have an influence on a number of people as they see the work that they have been involved in being curtailed.

We do feel that we have adequate people to continue the work that we are doing in fiscal year 1982 and would expect some further attrition when we go into the mode that we would operate under in fiscal year 1983.

Mr. **Yates**. Well, let me read on from this issue of "Inside Energy." Mr. Heffelfinger is still Assistant Secretary, isn't he?

Mr. **Tribble**. Yes.

Mr. **Yates**. Well, if he were of your mind, why would he make comments like this? "Heffelfinger commented on the problem when asked about the current rate of attrition at the department, after giving a brief presentation of DOE's fiscal year 1983 budget request to ERAB members. He said that the overall attrition rate is less than normal, perhaps reflecting many of the department's employees are taking 'a wait and see attitude' toward the administration's reorganization plans. But, he said, 'We are experiencing attrition in the wrong places. We are losing our senior people.'

"Heffelfinger predicted that by the end of fiscal year 1982, the department's manpower level will be about 1 percent to 2 percent lower than the personnel ceiling set for DOE by the Office of Management and Budget." That is unusual in itself, isn't it, that you go below the personnel ceilings in that way.

"But, he added, 'The hottest group of talent has already abandoned us.' The desertion of key senior officials is so great, he said, that even if Congress gives the department $400 million more than requested, 'You've still got a problem because you've lost some lateral-type talent that you need to continue programs at the level.'"

If Mr. Heffelfinger is right, why should we even give you the $21 million you want? In fiscal year 1982 you were operating at a level of $383,840,000. You propose to cut that back by $362 million to a level of $21,802,000.

Let's go back to Mr. Heffelfinger. "Heffelfinger bemoaned the effects of the so-called syndrome on management of the department. 'The toughest job we have is to maintain our morale . . . and our people,' he told the ERAB. 'Attrition has momentum, and a reduction in force frequently causes a strange reaction.'

"Later, DOE officials said the current attrition rate is about 8 percent a year compared with the historical average period of 10 percent to 12 percent a year. While the current rate is lower than average, one official pointed out it is still substantial, considering the overall poor condition of the economy and the fact that, for most officials leaving the department, 'There ain't no place to go.' Statistics are kept on the rate of attrition, but are not broken down by employee-grade levels, he said. The official confirmed the department has lost much of its talent but said that this has been observed rather than documented. 'When you keep getting invited to going away parties for two or three senior people, you begin to see what is going on,' the officials said."

Now, McGraw-Hill isn't an outrageously pessimistic organization. I wouldn't call it a New Deal liberal organization. Usually its statements are fairly conservative.

Now, would you agree with the statements that I have just read?

Mr. TRIBBLE. As I understand the statements that you read, they were direct quotes.

Mr. YATES. From Mr. Heffelfinger.

Mr. TRIBBLE. That is what I am saying.

Mr. YATES. I should have given you the exact quotes because the quotes are only part of what I read. Part of that was the reactions that he had, and part of it I guess were the reactions of others in the Department of Energy.

But, what I am really asking for is your reaction.

Mr. TRIBBLE. Well, in addressing that, we need to look at the conservation part of the DOE, as contrasted with the entire Department that Heffelfinger was speaking of. He of course, in his position does look at the overall picture, the picture for the entire Department.

In conservation the attrition rate is in fact running faster then we had anticipated that it would in fiscal year 1982. We are, at this time, below the onboard level that we would have anticipated. At the same time, we have watched very carefully to avoid getting into the posture of where we cannot go forward with the work that we have set out for us.

## EFFECTIVENESS OF GOVERNMENT CONSERVATION PROGRAMS

Mr. YATES. Well, this committee had the impression that of all the programs in the Department of Energy, perhaps the conservation programs were the most important. That in great measure, the fine record of conservation that has been built up over the past number of years in the demands by the American national economy for energy, that a significant portion of that was attributable to the initiatives undertaken by the conservation section of the Department of Energy.

Mr. **Tribble**. I would have to largely disagree with that statement.

Mr. **Yates**. All right, tell me why you disagree with that.

Mr. **Tribble**. In my judgment, the price increase of energy, and the anticipation of further prices increases, has been the primary force that has driven conservation in the last 7 years.

I was involved with industrial energy conservation from 1973 to 1980, and know that most of the conservation that was accomplished in industry during that period was motivated by increased cost of energy, and the anticipation of a further increase in cost. I am speaking of energy improvement on a per unit of production basis, not on the basis that a certain number of quads of energy have not been used, because of course, when you get into that, you get into the level of the economy.

As a matter of fact, we have had some studies that have indicated that only about 5 percent of the energy conservation that has taken place in this period of time is attributable to Government programs.

Mr. **Yates**. Can those studies be made available to the committee?

Mr. **Tribble**. Surely.

Mr. **Yates**. All right. The committee would like to see those studies.

[Committee note.—Subsequent to the hearing, the studies were provided to the committee. They will be retained in the committee files.]

Mr. **Tribble**. There is one further thought that I would like to make while we are on this subject. That is, if 5 percent of the energy conservation that has taken place has been due to energy programs, you in addition to that need to consider which programs produced the largest part of that conservation effort. And I suspect that you would find that the mileage impositions on the automotive manufacturers was a significant factor.

Certainly, the adjusting of the thermostats was a significant factor. And those were not related to conservation research at all, and their cost was relatively little.

Mr. **Yates**. Are those part of the Department's conservation programs? I don't believe you could consider them that. Your study, the so-called "Sunset Review," on page 185 says, "The conservation programs of the Department of Energy have played some role in this national trend, although the exact effect is difficult to quantify. Reviews of DOE conservation programs through fiscal year 1981 indicate that these programs have been responsible for significant savings in absolute terms, even though a major emphasis of these programs was on longer term research and development. In relative terms, however, the effects to date of the Department's conservation programs as well as tax credits on national energy consumption are believed to be small, probably accounting for less than 5 percent of the observed reduction in energy use per unit of GNP."

Yet, we come along to the Energy Conservation Coalition who say that even if it is small, probably accounting for less than 5 percent, they are extraordinarily cost-effective, paying back in 9.5 months of energy savings, the total amount spent by the Government on energy conservation programs for 8 years.

If that is true, then the Government programs have been effective. If they have been effective, does that mean that they are now no longer effective, and that there is justification for the action that you are taking?

It seems to me that your record justifies going forward with the conservation programs. If it is proposed to almost terminate the conservation program as is indicated by the figures in this budget, why leave the Department open at all except to pay the separation salaries of its employees?

Mr. TRIBBLE. Well, we certainly feel that the price will continue to be the driver, and that the programs that we have had will continue to have a minimal effect.

We should not ascribe the conservation that has taken place to Government programs, with the exception of this relatively small percentage. Then you, I think, have a legitimate question, is——

Mr. YATES. Yes. Why go forward with it then? For two reasons. Well, I am sorry. Go ahead and finish your statement.

### EXAMPLES OF LONG-TERM GENERIC RESEARCH

Mr. TRIBBLE. We feel that in changing the direction of the effort into a research posture, that we will be able to do some work that will be generally useful by a number of industries. And let me give you an example of what we are thinking in terms of. You are probably aware of the fact that many combustion processes are generally, or relatively inefficient. An automobile engine generates carbon monoxide, so forth.

Mr. YATES. Coal burning and so forth. All right.

Mr. TRIBBLE. Right. We have an ongoing program whereby we are able to study combustion as it takes place with laser spectroscopy at Sandia, at Livermore. We are able to look through a quartz cylinder head and examine the products of combustion as the flame front moves forward in the cylinder.

This enables us to determine where in the process the incomplete combustion is and where the particulates are formed. We feel that if we go forward with that kind of research and learn more about the combustion process itself, that we will be able to pass this information to industry, both the transportation industry, as well as central station activity or work——

Mr. YATES. Well, that is fine. I don't have any objection to that. As a matter of fact, I approve of that. But what happens to all the other activities in the conservation field? You know, as I sit here and think of the prospects of what we will do with this budget, I do not know why it makes sense to even go forward with it.

As I began the examination of this budget for the Department of Energy I was particularly interested in conservation, because I have long had the belief that we can conserve on oil consumption, for example. If you conserve the use of ten barrels of oil, you don't have to buy ten barrels of oil.

Mr. TRIBBLE. Right.

Mr. YATES. That is the cheapest and easiest way to do it.

Mr. TRIBBLE. No question.

## CONSERVATION ORGANIZATION

Mr. YATES. But now even if the committee were minded to restore, what, $300 million of the $362 million that you propose to cut, what can the committee do in the light of what Mr. Heffelfinger is saying?

Last year we examined Secretary Edwards, and at that time none of the Assistant Secretaries were in place. And we said, "Okay, that is understandable; you have just come on board yourself." But now none of the Assistant Secretaries are in place still, except Mr. Ogden and Ms. Savitz who is a Deputy Assistant Secretary.

Mr. TRIBBLE. I am sorry——

Mr. YATES. If you are losing your senior personnel, and if you are unable to find people to head the various departments, why, then, should Congress even consider going forward?

Mr. TRIBBLE. Mr. Chairman, I believe there is something in error about the statement that you made. We do have all of the Assistant Secretaries' positions filled.

Mr. YATES. You are right. I am in error. I should talk about the office directors. This indicates you are having acting office directors. Is that incorrect?

Mr. TRIBBLE. I think this is because paperwork hasn't caught up with action. Let me see.

Ms. SAVITZ. Directors in conservation have been in place for a couple years.

Mr. TRIBBLE. Yes.

Ms. SAVITZ. We had to change the paperwork as they changed the title of the office.

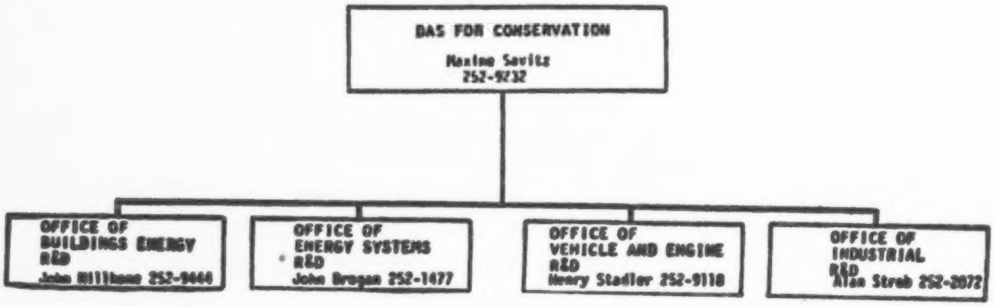
Mr. YATES. Well, this is all we have to go on.

Mr. TRIBBLE. Yes, and I am sorry.

Mr. YATES. Is this incorrect? If it is incorrect, would you correct it for us?

Mr. TRIBBLE. We would be glad to.

[The information follows:]


DAS FOR CONSERVATION
Maxine Savitz
252-9232
OFFICE OF BUILDINGS ENERGY R&D
John Millhone 252-9444
OFFICE OF ENERGY SYSTEMS R&D
John Brogan 252-1477
OFFICE OF VEHICLE AND ENGINE R&D
Henry Stadler 252-9118
OFFICE OF INDUSTRIAL R&D
Alan Streb 252-2072

Mr. **Yates**. Okay.

Mr. **Tribble**. Some of this paperwork is just now getting finalized to make these people, rather than acting, into the office director, even though they have been serving the function, doing the job. So, it is a matter that this gives the wrong impression. We will correct it.

### CONSERVATION BUDGET

Mr. **Yates**. All right. Mr. Tribble, here but for the grace of God sits you in the budget seat of the committee. In the face of Mr. Heffelfinger's comments, and in the face of what OMB has done, what would you do? Just provide $21 million for conservation? I guess OMB would tell you to answer the committee, "Yes, please give us the $21 million, and that is it."

Mr. **Tribble**. I would look carefuly at the proposals that are made on how that $21 million is to be spent, and evaluate them. Those they felt were worthwhile I would approve, and those that I didn't feel that way about, I would disapprove.

Mr. **Yates**. All right, that we propose to do. The question really was: Would you limit your expenditures to $21 million?

Mr. **Tribble**. If I had other good information that would lead me to the conclusion that there were other expenditures that could be made that would, in fact, be worth the Federal investment, in face of the fact that you have to go borrow the money and spend it, then I would propose those expenditures.

Mr. **Yates**. Okay. Let me ask you the question: Are there such expenditures you know about?

Mr. **Tribble**. I am not aware of those.

Mr. **Yates**. All right. Now, are your assistants allowed to provide the committee with examples of expenditures they consider to be proper?

Mr. **Tribble**. You know the answer to that, Mr. Chairman.

Mr. **Yates**. Well, I don't at the moment. If I know the answer to that, I still want it on the record from you.

### REVISIONS TO CIRCULAR A-10

Mr. **Tribble**. You probably got that piece of paper that we got from the Office of Management and Budget that tells us that——

Mr. **Yates**. Have we that piece of paper? All right. Let's see what that piece of paper says, for purposes of the record. This is dated March 29, 1982. "Circular number A-10 revised transmittal memorandum number one, to the heads of Executive Departments; Subject: Responsibilities for Disclosure with Respect to the Budget. This transmittal memorandum amends paragraph 4.D of OMB Circular A-10 revised dated November 12, 1976, paragraph four is changed to read, in responding to specific questions on program and appropriations requests, witnesses will refrain . . ." It says "will," not "shall," "witness will refrain from providing plans for the use of appropriations that exceed the President's request.

"Witnesses typically bear responsibility for one or a few programs whereas the President must weigh the needs of all the Federal

Government and compare them against each other and against revenues available to meet such needs."

I assume Congress doesn't have to do that, does it? Just the President has to do that.

"Where appropriate, witnesses should call attention to this difference in scope of responsibility, in explaining why it is not proper for them to support efforts to raise appropriations above amounts suggested by the President."

What is the function of the committee if it is not to provide money, not that which the President says should be available, but that which the Congress—the body that provides the money—says should be available for the job? The President makes recommendations. All right, let me find out.

Mr. TRIBBLE. You probably also have the cover letter that transmitted that to me from Deputy Secretary Davis, which was much more specific than——

Mr. YATES. Okay. We will put that in the record, too. Okay. That is dated April 1. That is later.

Mr. Davis is the Deputy Secretary. That is high up, isn't it?

Mr. TRIBBLE. He is next to the boss.

Mr. YATES. Yes, he is high up, right. He speaks for the boss, doesn't he? And he says this to the Under Secretary, Assistant Secretaries, Administrators, General Counsel, Chairman of the Federal Energy Regulatory Commission.

He cites the memorandum, I will put the whole thing in the record but he cites the memorandum from David Stockman. Then he says, "In carrying out these instructions, the Department will interpret this prohibition to encompass both written and oral responses to questions raised by Members of Congress or their staffs in energy hearings, meetings, correspondence or by telephone, and will also include inserts and answers to memoranda and staff questions to be provided for the record.

"All Congressional requests for capability statements and all other Congressional requests formal or informal for information on the use to which appropriations in excess of the President's requests should be put."

[The letters follow:]

EXECUTIVE OFFICE OF THE PRESIDENT,
OFFICE OF MANAGEMENT AND BUDGET,
*Washington, D.C., March 29, 1982.*

To the Heads of Executive Departments and Establishments.
Subject: Responsibilities for disclosure with respect to the budget.

This transmittal memorandum amends paragraph 4.d of OMB Circular No. A-10, Revised, dated November 12, 1976. Paragraph 4.d is changed to read:

"4.d. In responding to specific questions on program and appropraition requests, witnesses will refrain from providing plans for the use of appropriations that exceed the President's request. Witnesses, typically, bear responsibility for the conduct of one or a few programs, whereas the President must weigh carefully all of the needs of the Federal Government, and compare them against each other and against the revenues available to meet such needs. Where appropriate, witnesses should call attention to this difference in scope of responsibility in explaining why it is not proper for them to support efforts to raise appropriations above the amounts requested by the President."

This change is effective immediately.

DAVID A. STOCKMAN, *Director.*

U.S. DEPARTMENT OF ENERGY,
*April 1, 1982.*

MEMORANDUM

Subject: Responsibilities for disclosure of budget information.
To: Under Secretary, Assistant Secretaries, Administrators, General Counsel, Chairman, Federal Energy Regulatory Commission.

A memorandum from David Stockman amending OMB Circular A-10 is attached for your information and guidance.

This memorandum, dated March 29, 1982, amends paragraph 4.d of Circular A-10 to prohibit witnesses from providing plans for the use of appropriations in excess of the President's request.

In carrying out these instructions, the Department will interpret this prohibition to encompass both written and oral responses to questions raised by Members of Congress or their staffs in hearings, meetings, correspondence or by telephone. It will also include inserts and answers to Member and staff questions to be provided for the record subsequent to a Congressional hearing, all Congressional requests for capability statements, and all other Congressional requests, formal and informal, for information on the use to which appropriations in excess of the President's request would be put.

An exception to this prohibition is responses to questions dealing with what the Department requested from OMB or what was requested in the Department's internal review budget. These questions may be answered even though the data provided could be interpreted as a plan to increase the President's Budget. Where appropriate these answers should include a statement of support for the President's Budget.

The Assistant Secretary for Management and Administration should notify the cognizant appropriations subcommittees of these instructions, and the Assistant Secretary for Congressional, Intergovernmental, and Public Affairs should take steps to inform the proper authorization subcommittees.

Addresses should ensure that all program offices under their control which deal with Congressional testimony and requests for information including detached elements such as Field Offices, Laboratories, Energy Technology Centers and Power Administrations, are apprised of this policy.

W. KENNETH DAVIS,
*Deputy Secretary.*

Attachment.

Mr. TRIBBLE. In the face of that kind of direction you wouldn't want me put in that kind of a spot would you, Mr. Chairman?

Mr. YATES. Well, the point is that previous witnesses have said that they had received instructions that they were permitted to respond to direct requests for information from the Congress. Your interpretation is that you are no longer permitted to provide the Congress with information that the Congress requests, if that information exceeds, or may exceed, the amount of the budget request.

In other words, you won't give us the information that we need to carry out what you said you would do if you were sitting in my chair, namely: Provide money for programs that you thought would help the Government. Your interpretation is that I have got to go somewhere else for information about those programs. You are not going to give it to me, and none of your people are going to give it to me, isn't that what you are saying?

Mr. TRIBBLE. Well, I think in all seriousness, the intent——

Mr. YATES. I am very serious.

Mr. **Tribble**. Surely.

Mr. **Yates**. Yes.

Mr. **Tribble**. Is to say that the Department's position is reflected in the President's budget. And we feel that that is what we should support.

### CONGRESS NEED FOR BUDGET INFORMATION

Mr. **Yates**. This is right. I will agree with that. But suppose the Congress doesn't agree with your position and wants additional information. We, for example, think that the conservation programs are excellent programs. We think that there ought to be money invested, say, for example, in building and community systems or industrial programs far beyond what you think ought to be invested in it. Suppose we ask you how we should provide that money.

Under this instruction, could you give us your opinion as to how that money should be allocated?

Mr. **Tribble**. I think under that, that if you came forward with requests for information on a specific program or project, then we would be able to respond. That is my own personal interpretation.

For example, if you have a proposal that you think would be worthwhile, I believe we would certainly be permitted to give you information relative to that proposal.

Mr. **Yates**. Well, I read from Mr. Davis' statement. "This memorandum amends A-10 to prohibit witnesses from providing plans for the use of appropriations in excess of the President's request."

Mr. **Tribble**. I agree. I think we are trying to find that narrow line between——

Mr. **Yates**. But he says you can't do it.

Mr. **Tribble**. We cannot come to you and say: "We think we should do all these things," or "We could do all of these things, give us money for it." We can't do that.

Mr. **Yates**. Right. You can't do that.

Mr. **Tribble**. That is right.

Mr. **Yates**. Suppose Congress says: We have a plan for the use of appropriations in excess of the President's request. We want to put more money into building and community assistance than you asked for. Will you tell us what you consider to be the logical way for using that money?

Mr. **Tribble**. I don't believe we can do that under that guidance.

Mr. **Yates**. Then where should we go for that information? If you are not the person, how would you advise this committee to act? Where should this committee go for that information.

Frankly, between you and me, isn't that a stupid admonition? You are dealing with these programs every day. You know what you have to deal with. You know what you consider to be the most important ones.

Mr. Stockman has said: You can only spend so much money. You say: Okay, you have told me how much money I can spend. We will spend it in these ways.

You may believe that you ought to spend more money in certain areas, but Mr. Stockman has said you can't do that. Therefore, you are a good soldier and you go along with Mr. Stockman. There isn't anything else you can do as a matter of fact.

The Congress has a voice in this, too. The Congress is supposed to have some say on what the budget should be. But what you are saying is that if you propose to act, we are just not going to tell you how to do it. We aren't going to give you our opinion. We have no expertise in this matter. And it just doesn't make sense to me.

I think what has happened, actually, is that Mr. Stockman has done what President Nixon used to call circling the wagons. You are circling the wagons around the budget, and if we attempt to get through those wagons, you are going to shoot us down if you can.

I think that is a terrible way to run the Government.

Mr. TRIBBLE. Mr. Chairman, what would lead you to the conclusion that the Congress should allocate more money?

Mr. YATES. You are asking the wrong fellow that question, because I just don't happen to agree with the President's budget on many of these activities. But, I would have thought that even though the President and I have a disagreement on the amount of money that ought to be spent, if the Congress decides more money should be spent, the President has a right to veto it, or to ask for rescission or deferral in order to say we won't do that.

If the Congress wants the opinion and advice of the President's staff, I believe they act for the Congress as well as for the President, but A-10 says they do not. I am going into all this because I think this is a foolish way for a Government to be run.

### OUTSIDE SOURCES OF INFORMATION

What you are doing is requiring us to go out and look for witnesses, to tell us how money should be spent in the event we think there ought to be a program development. For example, after all the millions we spent in magnetohydrodynamics, you decide not to spend any more money on it. Well, that means all the money we have spent goes down the drain. Suppose the Congress comes to the conclusion we ought to spend more money on magnetohydrodynamics because it is an encouraging process. We can't come to you and say: Where would you put the money in magnetohydrodynamics? We can't ask you that, can we?

Mr. TRIBBLE. I am under the impression that you are right.

Mr. YATES. I can't ask you that, which is a terrible way to proceed.

Maybe what we will have to do is go to the Russians. The Russians are making great strides in magnetohydrodynamics. If my memory is right, they are still using a magnet we gave them for that purpose. I do not know. Does your program provide for continued cooperation with the Russians on magnetohydrodynamics, do you remember?

Mr. TRIBBLE. That is not in my bailiwick, Mr. Chairman.

Mr. YATES. I see. I will have to ask someone else that question.

Regardless of that, suppose we decide the Stirling engine should be continued, and then we ask you how to spend the additional money for the Stirling. You won't tell us, will you?

Mr. TRIBBLE. We could suggest a source.

Mr. YATES. Okay. Are you violating Mr. Davis' admonition if you suggest a source?

Mr. **Tribble**. I think you know that the source would be a Swedish company that has a great interest in this.

Mr. **Yates**. Right. Sure.

Mr. **Tribble**. I do not think we are having——

Mr. **Yates**. Okay now, you could suggest a source. There are other companies that are interested in the Stirling. I know there is an American company that has an interest in the Stirling. What is the name of the company? Mechanical Technology Incorporated has an interest in this. They have written letters, they have testified before this committee. So, we know about their interest. Suppose I were to ask you, should we continue to invest money in the program of this company?

Mr. **Tribble**. My answer would be no.

Mr. **Yates**. Would you be able to answer it? Oh, your answer would be no because you can't spend the money anyway?

Mr. **Tribble**. We would recommend that that be terminated.

Mr. **Yates**. Suppose we were to inquire of the Swedish company, should we invest more money in the Stirling engine than we have? And the Swedish company says yes. We then go to you and say the Swedish company said that we should invest more money in the Stirling engine than you requested. Would you be able to tell us whether the opinion of the Swedish company should be approved?

Mr. **Tribble**. I doubt that our opinion would be altered by the opinion of the Swedish company.

Mr. **Yates**. Why are you sending us there? What you are saying is, Congressman, this is our opinion. Don't ask us anything else, isn't that right?

Mr. **Tribble**. That is a carefully considered opinion and——

Mr. **Yates**. Carefully considered in the light of the budget constraints.

Mr. **Tribble**. No, this was considered, this particular——

Mr. **Yates**. You mean the Stirling engine?

Mr. **Tribble**. Yes, would be considered separate from the budget——

Mr. **Yates**. But you would have to say, as have so many witnesses who have appeared before us, "Congressman, this is a reasonable appropriation in view of budget constraints." But deep in your heart, I am sure you believe that you should go forward with some of these programs.

I won't ask you to say that for the record if you don't want to. Would you rather not?

Mr. **Tribble**. I do not know of any offhand.

Mr. **Yates**. Okay, I am not allowed to ask even Ms. Savitz or Mr. Chiogioji that question, am I?

Mr. **Tribble**. You are allowed to ask them.

Mr. **Yates**. What would happen if they answered?

Mr. **Tribble**. I would say that they would do so at their own peril.

### INADEQUACY OF CONSERVATION BUDGET

Mr. **Yates**. They would join the vast army of senior executives who are leaving the Department of Energy.

Well, at such time as you decide to leave, would you let me know so that I can ask you these questions? At any rate, you know, this is kind of an exercise in futility. I do know that Mr. Ottinger and members of the authorizing committees are very much interested in these programs, as is this committee.

It is an unfortunate termination, really. We are ending these programs with a whimper instead of a bang. I think we have built up a good record over the years. Even with only a 5 five percent impact on the amount of conservation that has occurred in this country, the program has been cost effective. It is too bad that you are just shutting the door on it.

I do not think industry can do this by itself even though it has investments to protect. There is a place for Government in many of these fields beyond the $17,542,000 that you propose for research. But, that is my view.

In view of your uncooperative attitude with respect to discussing amounts exceeding budget, there is little we can do.

### ENERGY IMPACT ASSISTANCE

Not only do you request relatively small amounts for your 1983 budget, but you want to rescind some money. You want to rescind $14 million of energy impact assistance funds.

Now, what area of the country was this money originally designed to help?

Mr. TRIBBLE. I believe this is administered through the Department of Agriculture and is quite widespread.

Mr. YATES. Do you not have any say on this program?

Mr. TRIBBLE. I would like to ask Dr. Savitz to answer this question, because I am sure she is more familiar with it.

Mr. YATES. All right. We have great respect for Dr. Savitz. What is your answer Dr. Savitz?

Ms. SAVITZ. We establish which areas are considered to be impacted. About 95 areas in 25 States have been approved as impact areas. These areas submit their proposals to the Department of Agriculture for the money, and Agriculture gives them the grants.

So, our role is just in establishing what area meets the criteria of impact. Agriculture gives the grant and monitors it.

Mr. YATES. I see. Do you happen to know what areas of the country this money originally was designed to help?

Ms. SAVITZ. Wherever there was going to be energy development.

Mr. YATES. Do you know where it was going to be allocated?

Ms. SAVITZ. I have a list that can be provided for the record.

Mr. YATES. It will be placed in the record at this point.

[The information follows:]

### APPROVED ENERGY IMPACT AREAS (As of October 1981)

#### ALABAMA

1. Bibb County;
2. Blount County;
3. Dekalb County;
4. Jefferson County;
5. Marion County, and
6. Tuscaloosa County.

### ARIZONA

1. Parts of Maricopa and Yavapai Countries.

### ARKANSAS

1. Crawford, Sebastian, Franklin, Scott, Logan, Johnson, and Yell Countries.

### COLORADO

1. Jackson County;
2. Routt County;
3. Moffat County;
4. Rio Blanco County;
5. Garfield County;
6. Mesa County;
7. Delta County;
8. Montrose County;
9. Gunnison County;
10. Fremont County; and
11. Las Animas County.

### ILLINOIS

1. Clinton, Franklin, Jackson, Jefferson, Perry, Randolph, Saline, St. Clair, Washington, and Williamson Countries;
2. Fulton and Knox Countries;
3. Hamilton County;
4. Macoupin County;
5. McDonough County;
6. White County; and
7. Logan County.

### INDIANA

1. Clay, Daviess, Dubois, Fountain, Gibson, Greene, Knox, Martin, Perry, Pike, Posey, Spencer, Sullivan, Vanderburgh, Vermillion, Vigo, and Warrick Countries.

### KENTUCKY

1. Bell, Boyd, Breathitt, Carter, Clay, Elliott, Floyd, Greenup, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, McCreary, Magoffin, Martin, Menifee, Morgan, Owsley, Perry, Pike, Pulaski, Rockcastle, Wayne, Whitley, and Wolfe Countries.
2. Butler, Caldwell, Christian, Daviess, Edmonson, Grayson, Hancock, Henderson, Hopkins, McLean, Muhlenberg, Ohio, Union, Warren and Webster Counties.

### LOUISIANA

1. Bienville, DeSoto, Natchitoches, Red River and Sabine Parishes.

### MARYLAND

1. Allegany and Garratt Countries.

### MISSOURI

1. Putnam County;
2. Macon and Randolph Countries; and
3. Bates and Henry Countries.

### MONTANA

1. Musselshell, Treasure, Rosebud, Custer and Powder River Countries.

### MONTANA/WYOMING

1. Carbon, Yellowstone and Big Horn Counties, Montana, and Sheridan and Johnson Counties, Wyoming.

### NEBRASKA

1. The City of Alliance.

### NEW MEXICO

1. San Juan County;
2. McKinley County;
3. Valencia and Cibola Counties;
4. Sandoval County; and
5. Colfax County.

### NORTH DAKOTA

1. Grant County;
2. McLean County;
3. Mercer County;
4. Morton County;
5. Oliver County;
6. Adams and Bowman Counties.

### OHIO

1. Athens, Belmont, Carroll, Columbiana, Coshocton, Gallia, Guernsey, Harrison, Hocking, Holmes, Jackson, Jefferson, Lawrence, Mahoning, Meigs, Monroe, Morgan, Muskingum, Noble, Perry, Stark, Tuscarawas, Vinton, Washington and Wayne Counties; and
2. Adams, Pike, Ross and Scioto Counties.

### OKLAHOMA

1. Craig, Nowata and Rogers Counties and part of Mayes County; and
2. Haskell, Latimer, Leflore and Pittsburg Counties.

### PENNSYLVANIA

1. Armstrong, Bulter and Clarion Counties;
2. Centre and Clearfield Counties;
3. Beaver, Fayette, Greene and Washington Counties;
4. Clinton County;
5. Jefferson County;
6. Lawrence County;
7. Somerset County;
8. Northumberland County;
9. Venango County;
10. Cambria; and
11. Luzerne, Columbia and Schuylkill Counties.

### SOUTH DAKOTA

1. Fall River County.

### TENNESSEE

1. Anderson County.
2. Bledsoe County;
3. Campbell County;
4. Cumberland County;
5. Fentress County; and
6. Scott County.

### TEXAS

1. Harrison County;
2. Jim Hogg County;
3. Webb County;
4. Grimes and Brazos Counties;
5. Coleman County;
6. Robertson, Leon, Limestone and Freestone Counties;
7. The City of Childress;

8. Titus, Franklin, Morris, and Hopkins Counties;
9. Bee, Duval, Jim Wells and Live Oak Counties;
10. Rusk and Panola Counties;
11. Atascosa, Karnes and Wilson Counties; and
12. Cherokee and Smith Counties.

### UTAH

1. Garfied County;
2. Kane County;
3. Carbon, Emery, Grand, San Juan and Sanpete Counties; and
4. Sevier and Wayne Counties.

### VIRGINIA

1. Lee, Wise, Scott, Buchanan, Dickerson, Russell and Tazewell Counties and the City of Norton.

### WEST VIRGINIA

1. Barbour, Fayette, Grant, Greenbrier, Mineral, Nicholas, Randolph, Tucker, Upshur and Webster Counties;
2. Boone, Cabell, Clay, Kanawha, Lincoln, Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wayne and Wyoming Counties; and
3. (conditionally approved) Harrison, Marion, Monongalia, Preston, Taylor and Wetzel Counties.

### WYOMING

1. Campbell, Crook and Weston Counties;
2. Lincoln, Uinta, and Sweetwater Counties;
3. Converse and Natrona Counties;
4. Carbon County;
5. Fremont County.

## APPLICATIONS COVERING AREAS WHICH WERE NOT ULTIMATELY APPROVED

### ARIZONA AND NEW MEXICO

1. The Arizona portion of the Navajo Reservation, the Hopi Reservation (in Arizona), and an area surrounding the Pittsburg-Midway mine in McKinley County, New Mexico. (Note: the New Mexico portion of the area is part of an approved area—McKinley County.)

### ARKANSAS

1. Bradley, Calhoun, Dallas, Ouachita and Union Counties.

### FLORIDA

1. Desoto, Hardee and Polk Counties.

### ILLINOIS

1. Wabash County; and
2. Christian and Montgomery Counties.

### MISSOURI

1. Howard County.

### PENNSYLVANIA

1. Elk County; and
2. Indiana County.

### TENNESSEE

1. Grundy County;
2. Marion County; and
3. Rhea County.

## TEXAS

1. Anderson County;
2. Henderson County;
3. Milam County; and
4. The City of Dalhart.

## ENERGY IMPACTED AREA DEVELOPMENT ASSISTANCE

[Fiscal year 1979 allocations [1]]

| | Planning grants | Site acquisition and site develpment grants | Total 601 allocation |
|---|---|---|---|
| Alabama | $78,000 | $830,000 | $908,000 |
| Arizona | 83,000 | 200,000 | 283,000 |
| Colorado | 98,000 | 1,310,000 | 1,408,000 |
| Illinois | 95,000 | 720,000 | 815,000 |
| Indiana | 64,000 | 0 | 64,000 |
| Kentucky | 180,000 | 2,934,000 | 3,114,000 |
| Louisiana | 75,000 | 218,000 | 293,000 |
| Maryland | 38,000 | 0 | 38,000 |
| Missouri | 85,000 | 0 | 85,000 |
| Montana | 111,500 | 175,000 | 286,000 |
| Nebraska | 22,000 | 0 | 22,000 |
| New Mexico | 86,000 | 966,000 | 1,052,000 |
| North Dakota | 77,000 | 692,000 | 796,000 |
| Ohio | 92,000 | 953,000 | 1,045,000 |
| Pennsylvania | 85,000 | 1,056,000 | 1,141,000 |
| South Dakota | 55,000 | 496,000 | 551,000 |
| Tennessee | 54,000 | 656,000 | 710,500 |
| Texas | 52,000 | 186,000 | 238,000 |
| Utah | 75,000 | 0 | 75,000 |
| Virginia | 76,000 | 992,000 | 1,068,000 |
| West Virginia | 218,000 | 3,000,000 | 3,218,000 |
| Wyoming | 200,000 | 1,958,000 | 2,158,000 |

[1] Distributed to FmHA State Directors.

## ENERGY IMPACTED AREA DEVELOPMENT ASSISTANCE

[Fiscal year 1980 allocations [1]]

| | Planning grants | Site acquisition and site development grants | Total 601 allocation |
|---|---|---|---|
| Alabama | $160,000 | $1,336,700 | $1,496,700 |
| Arizona | 50,000 | 0 | 50,000 |
| Arkansas | 100,500 | 0 | 100,500 |
| Colorado | 205,000 | 2,528,000 | 2,733,000 |
| Illinois | 254,000 | 2,042,000 | 2,296,000 |
| Indiana | 117,000 | 840,000 | 957,000 |
| Kentucky | 350,000 | 5,141,700 | 5,491,700 |
| Louisiana | 217,000 | 610,000 | 827,000 |
| Maryland | 35,000 | 0 | 35,000 |
| Missouri | 75,000 | 1,120,000 | 1,195,000 |
| Montana | 155,000 | 950,000 | 1,105,000 |
| New Mexico | 225,000 | 1,754,000 | 1,979,000 |
| North Dakota | 150,000 | 1,870,000 | 2.020,000 |
| Ohio | 195,000 | 1,455,000 | 1,640,000 |
| Oklahoma | 105,000 | 0 | 105,000 |
| Pennsylvania | 245,000 | 1,140,000 | 1,385,000 |
| South Dakota | 75,000 | 410,000 | 485,000 |
| Tennessee | 172,000 | 151,500 | 323,500 |

## ENERGY IMPACTED AREA DEVELOPMENT ASSISTANCE—Continued

[Fiscal year 1980 allocations [1]]

| | Planning grants | Site acquisition and site development grants | Total 601 allocation |
|---|---|---|---|
| Texas | 295,000 | 1,845,500 | [2] 2,217,120 |
| Utah | 121,000 | 1,470,500 | 1,591,500 |
| Virginia | 155,000 | 2,124,000 | 2,279,000 |
| West Virginia | 400,000 | 5,677,500 | 6,077,500 |
| Wyoming | 350,000 | 4,652,000 | 5,002,000 |

[1] Distributed to FmHA State Directors.

[2] Includes additional $76,620 from National Office Reserve.

## ENERGY IMPACTED AREA DEVELOPMENT ASSISTANCE

[Fiscal year 1981 allocations [1]]

| | Planning grants | Site acquisition and site development grants | Total 601 allocations |
|---|---|---|---|
| Alabama | $89,200 | $394,500 | $483,700 |
| Arkansas | 59,300 | 78,600 | 137,900 |
| Colorado | 30,700 | 455,300 | 486,000 |
| Illinois | 41,200 | 327,000 | 368,200 |
| Indiana | 40,000 | 327,800 | 367,800 |
| Kentucky | 133,400 | 770,100 | 903,800 |
| Louisiana | 61,500 | 370,500 | 432,000 |
| Maryland | 17,100 | 99,400 | 116,500 |
| Missouri | 0 | 118,600 | 118,600 |
| Montana | 41,200 | 300,000 | 341,200 |
| Nebraska | 0 | 162,000 | 162,000 |
| New Mexico | 52,100 | 520,700 | 572,800 |
| North Dakota | 50,000 | 300,000 | 350,000 |
| Ohio | 18,200 | 170,000 | 188,200 |
| Pennsylvania | 44,800 | 441,500 | 486,300 |
| South Dakota | 25,000 | 100,000 | 125,000 |
| Tennessee | 14,000 | 109,000 | 123,000 |
| Texas | 61,800 | 250,000 | 311,800 |
| Utah | 65,800 | 545,300 | 611,100 |
| Virginia | 0 | 205,000 | 205,000 |
| West Virginia | 0 | 357,300 | 357,300 |
| Wyoming | 54,800 | 731,320 | 786,120 |

[1] Distributed to FmHA State Directors.

Mr. YATES. How about the counties that have requested impact assistance?

Ms. SAVITZ. Many have received money already. Over the years about $57 million has been obligated.

Mr. YATES. Is there further need for impact assistance?

Ms. SAVITZ. It is felt there isn't now.

Mr. YATES. Who feels that?

Ms. SAVITZ. As industry is going to develop the areas, the industry will work with the local governments and continue the development for the impacted areas.

Mr. YATES. Are they doing that now?

Ms. SAVITZ. Companies like Arco and Exxon have been working with some of the local counties in Wyoming and other States.

Mr. **Yates**. Are you saying there is no longer a need for the impact assistance program?

Ms. **Savitz**. I think enough——

Mr. **Yates**. The answer is yes?

Ms. **Savitz**. Yes.

### EMERGENCY PREPAREDNESS

Mr. **Yates**. You also want to rescind $5,663,000 under the State grant program for gasoline rationing preimplementation. Gasoline rationing is obviously no longer an option. Do you think the States could use this money effectively for emergency preparedness activity?

Mr. **Tribble**. I believe they have other funds for that.

Mr. **Yates**. So, they don't need this money for that?

Mr. **Tribble**. I can't imagine. Well, you will always find that States would say they need it.

Mr. **Yates**. Of course they would.

What are the "other funds" that you referred to?

Mr. **Tribble**. Under the State energy conservation program we assist them in establishing State energy offices. I would think that those offices could handle that problem.

Mr. **Yates**. Aren't you terminating those grants?

Mr. **Tribble**. We would like to.

Mr. **Yates**. Haven't you proposed to terminate them?

Mr. **Tribble**. Yes.

### RESCISSION REQUEST

Mr. **Yates**. If the Congress chose to reject the rescission, and to reprogram the funds to either low income weatherization or schools and hospitals, how many additional homes could be weatherized with the $20 million? Are you allowed to answer that question?

Mr. **Tribble**. Twenty thousand, I believe. It takes about that under the present guidelines. It is $1,000 per home.

Mr. **Yates**. Are you allowed to answer that question under Mr. Davis' restrictions?

Mr. **Tribble**. I think so. I hope I am right.

Mr. **Yates**. You get the $20 million out to the States in time to be useful for next winter?

Mr. **Tribble**. I think so.

Mr. **Yates**. Suppose the money were applied to the schools and hospitals program. What would the $20 million accomplish?

Mr. **Tribble**. It would all depend on the proposals that had been submitted through the States for the use of those kinds of funds.

Actually, I think there are some $48 million in that program for fiscal year 1982. So, that that would be a very substantial increase.

### BUSINESS ENERGY TAX CREDITS

Mr. **Yates**. Is the President's recommendation to eliminate business energy tax credits consistent with promoting energy conservation?

Mr. **Tribble**. I think you have to consider that in light of the provisions of the 1981 Tax Act which provide for incentives for the industries to install not only energy conservation measures, but also additional capital investments.

Certainly a tax credit is an incentive in that it does improve the return on investment. When you balance that against the accelerated depreciation that is permitted under this 1981 law, there is not a great deal of difference.

### RETURN ON GOVERNMENT INVESTMENT IN CONSERVATION

Mr. **Yates**. The Energy Conservation Coalition says "If Government energy conservation programs account for 5 percent of the energy savings in 1980, they are extraordinarily cost effective, paying back in 9½ months of energy savings the total amount spent by the Government on energy conservation programs for 8 years."

Would you agree with that?

Mr. **Tribble**. I would say that if I make an investment and I make a return on investment that is satisfactory, that is one thing. But if you make an investment on which I get the return on investment, I dare say you would not consider that a very worthwhile investment.

I think you have to look at the Government's investment in conservation in terms of whether or not it is in the national interest to accomplish what that investment accomplishes. That to me is the return on investment to the Nation. The fact that the Government spends dollars to save industry dollars, is not in that context in my opinion. The savings to the industry does not constitute return on investment to the Nation.

Mr. **Yates**. Would it not? If the objective is conservation, and if the industries are able to conserve as a result of this investment, isn't that a savings for the Nation as well as for the Administration?

Mr. **Tribble**. I do not know that it is one that we could justifiably spend those kinds of dollars on, because if we could, we could find places to put billions.

Mr. **Yates**. Well, you just pointed out your laser experiment in which you are willing to invest money to go forward with the program, because it would be useful to industry later on.

Mr. **Tribble**. Right.

Mr. **Yates**. Is that not an example of where a Government investment is used to help industry and presumably the help it gives industry will help the Nation?

Mr. **Tribble**. You have to look at what you are doing. In this instance, in the combustion project, we think we will be advancing the state of the art.

We are not simply going to an industry and spending some money on conservation that will give them a return on investment; we are giving them additional information to use.

Mr. **Yates**. I do not know that we got an answer to our question as to whether, in your opinion, the Federal Government's conservation programs, even though accounting for only 5 percent of the energy savings, have been sufficiently cost effective?

This coalition is saying that the savings exceeded the amounts expended by the Government on energy conservation programs for 8 years. The ROI is just one of the factors in consideration.

What I am asking is whether or not the investment by the Government on energy conservation programs for the last 8 years was exceeded by the savings in conservation. Do you have an opinion on that?

Mr. **Tribble**. Well, the investment was made by the Government. The savings was made by industry.

Mr. **Yates**. Yes, but the question is whether or not the total amount spent by the Government on energy conservation programs for the last 8 years was more than made up by the amount saved in energy, either by industry or by the Government.

Mr. **Tribble**. I think if you want to consider that that is an appropriate ROI structure, then, yes, you would have to say that it was cost effective.

Mr. **Yates**. Would you not consider that to be appropriate?

Mr. **Tribble**. No.

Mr. **Yates**. You would not?

Mr. **Tribble**. No.

Mr. **Yates**. Okay. May I ask Dr. Savitz the same question? Are you allowed to differ with your boss?

Mr. **Tribble**. Oh, yes.

Mr. **Yates**. All right, Dr. Savitz. Feel free to differ.

Ms. **Savitz**. I guess I would tend to give the facts. I can tell you how much the Federal Government has spent for R&D programs, and State and local government programs over that period of time.

Mr. **Yates**. We can tell you that too.

Ms. **Savitz**. Then you take 5 percent and see how many quads that is and what they are. But, again, I would iterate, the savings are made by industry.

Mr. **Yates**. Yes, but this is a concept that I am not sure I am willing to accept. Even assuming the savings are made by industry, we still have to import oil and other energy sources. If we have a conservation program that reduces industrial energy consumption, we don't have to import as much, and industry can use the money saved due to decreased operating costs for other purposes.

The balance of payments is cut back. It is improved to that extent. I am trying to find out whether the investment by the Federal Government in the conservation programs placed this country in a better energy position.

Ms. **Savitz**. In some of our past expenditures, it did accelerate the introduction of some technologies which would account for some of that 5 percent. Your committee has heard in the past that some of the programs that we sponsored are being adopted by industry.

So, there are specific examples of some projects that we have done that one can say are being implemented and used by industry, and in homes, to save energy, and those energy savings do result in improved profitability and in turn provide an additional stream of revenue for the Government.

## ECONOMIC RECOVERY PROGRAM

Mr. **Yates**. On page 15 of your justification you say: "The President's economic recovery program, which includes lower taxes, tax credits for R&D, and removal of unnecessary regulatory burdens, will improve the efficient operation of the market for energy."

Is that just a conclusion that you think will happen, or do you have supporting evidence? Is that something you consider to be self-evident without the need for justifying?

Mr. **Tribble**. Yes, I would think so. Certainly the elimination of the regulatory burden would improve the efficient operation of the marketplace. Tax credits for R&D would certainly give impetus to R&D. And lower taxes would provide businesses with more money which could be directed in that way.

Mr. **Yates**. But you have no tangible evidence, examples of that having taken place?

Mr. **Tribble**. I would have to answer no to that question.

## REASONS FOR CONSERVATION TRENDS

Mr. **Yates**. What portion of our energy savings are a result of conservation as opposed to a reduced level of economic activity? Does the Department of Energy have any statistics or any studies on that?

Mr. **Tribble**. Yes, we do.

Why don't we just give you a copy of this? I think this pretty well tells the whole story. This is a graph that demonstrate the projected growth in energy use in terms of quads.

This projection made back in 1972, 1973, which is a base case. And then the actual use of energy over this timeframe, as you can see, is quite different from that projected, and the differences between the base case and the actual have been broken out, and those various factors constitute that difference.

Mr. **Yates**. The document you handed me is marked "draft."

Mr. **Chiogioji**. This is a more up-to-date one.

Mr. **Tribble**. Let me exchange with you. This one is a final.

Mr. **Yates**. All right, this is entitled, "Briefing Materials on Trends in Energy Use and Conservation," prepared by the Office of Policy, Planning and Analysis at the U.S. Department of Energy, dated April 14, 1982.

Well, that is pretty recent. I think it should go into the record at this point.

[The information follows:]

# Briefing Materials

on

# TRENDS IN ENERGY USE AND CONSERVATION

prepared
by

Office of
Policy, Planning and Analysis
U.S. Department of Energy
Washington, D.C. 20585

April 14, 1982

## INTRODUCTION

- Attached are four charts showing trends in energy use and conservation between 1972 and 1981. The first chart is for the U.S. economy. The other three are for industry, autos, and residences. The last three together account for about 70% of total energy use.

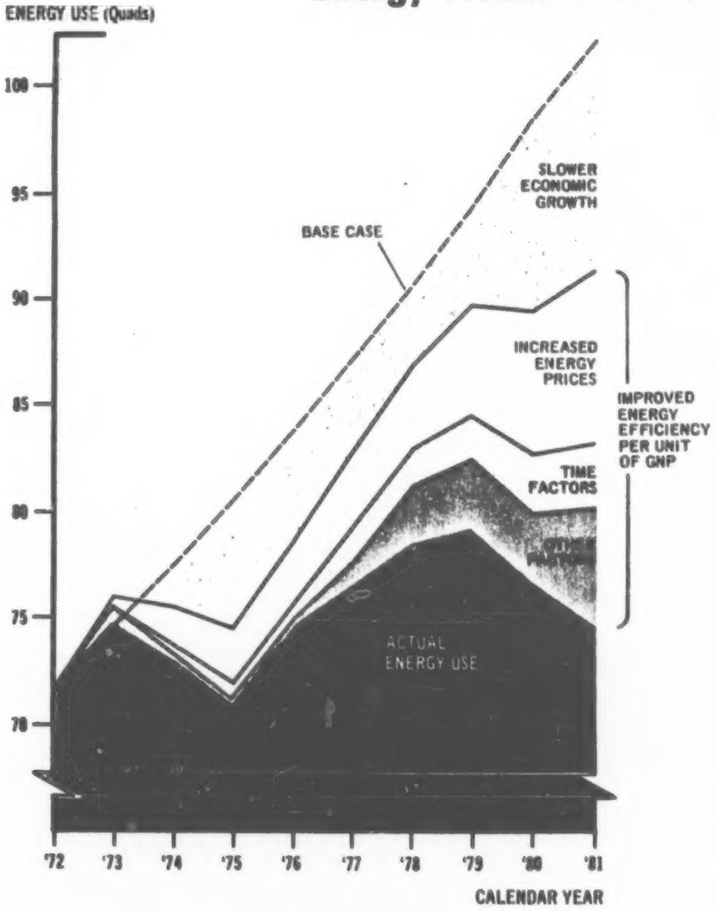
- All four charts show large reductions in energy use in the post-embargo (1973-1981) period, compared to pre-embargo trends.

- These reductions are explained on the charts by a number of factors, including increased energy prices and the slowdown in the economy. The more important factors and their "energy reducing" effects are delineated by degrees of shading.

- Graphically, the charts provide a visual perspective of the relative size and importance of each contributing factor.

- The charts are useful, we believe, in conveying in a simple and unclutterd way the fairly complex subject of how the U.S. and its various economic sectors are responding to energy's higher price and to the many other energy related "phenomena" of the last decade.

# Energy Trends in the U.S. Economy



- **ENERGY USE** in 1981 was down **28 quads** from the base case.
- These **ENERGY SAVINGS (27%)** are the result of several factors:
  - **SLOWER ECONOMIC GROWTH (11 quads)**.... GNP slowed from **4.0** to **2.7** percent per year after 1972;
  - **HIGHER ENERGY PRICES (8 quads)**.... motivating accelerated efficiency improvements, better energy management, and changes in consumer preferences;
  - **TIME FACTORS (3 quads)**.. improved energy efficiencies consistent with trends of the last several decades;
  - **OTHER FACTORS (6 quads)**.. accelerated efficiency improvements not directly related to increased energy prices, including:
    - **accelerated economic trends** away from heavy industry toward the service and information industries, and lighter manufacturing;
    - **technological advances:** R & D, turnover of capital stock, expansion of modern businesses, and other recent innovations;
    - **energy shortages:** gasoline lines, fuel allocations and natural gas curtailments;
    - **deregulation** of energy using industries — airlines, trucks, and railroads — allowing more flexibility to become energy efficient;
    - **increasing public awareness**, through the news and other media, of the energy crisis and solutions;
    - **conservation programs** of utilities, the private sector, and state and federal governments, including tax credits and deductions for conservation investments;
- **FEDERAL PROGRAMS** and **TAX CREDITS** probably account for less than **5** percent of the overall increase in energy efficiency per unit of GNP due to **ENERGY PRICE INCREASES, TIME,** and **OTHER FACTORS.**

Source: R. Marlay, Office of Policy, Planning and Analysis, U.S. Department of Energy. Analysis based on data from the U.S. Department of Commerce and the Energy Information Administration, and on statistical work of the Oak Ridge National Laboratory, Oak Ridge, TN.

[redacted]

## ENERGY TRENDS IN THE U.S. ECONOMY
(Energy Use in Quads)

| Year | Base[1] Case $E_1$ | Constant[2] Dollar GNP | GNP[3] Adjusted $E_2$ | Increased[4] Prices $dE_3$ | Price[5] Adjusted $E_3$ | Histor-[6] ical Trends $dE_4$ | Trend[7] Adjusted $E_4$ | Actual[8] Energy Use $E_5$ |
|---|---|---|---|---|---|---|---|---|
| 72 | 71.6 | 1185.9 | 71.6 | 0.0 | 71.6 | 0.0 | 71.6 | 71.6 |
| 73 | 74.6 | 1255.0 | 75.8 | 0.2 | 75.6 | 0.3 | 75.3 | 74.6 |
| 74 | 77.5 | 1248.0 | 75.4 | 1.7 | 73.7 | 0.6 | 73.1 | 72.8 |
| 75 | 80.6 | 1239.9 | 74.5 | 2.5 | 72.0 | 0.8 | 71.2 | 70.7 |
| 76 | 83.8 | 1300.4 | 78.5 | 2.9 | 75.6 | 1.2 | 74.4 | 74.5 |
| 77 | 87.1 | 1371.7 | 82.9 | 3.7 | 79.2 | 1.5 | 77.7 | 76.3 |
| 78 | 90.6 | 1436.9 | 86.8 | 3.9 | 82.9 | 1.9 | 81.0 | 78.2 |
| 79 | 94.3 | 1483.0 | 89.6 | 5.1 | 84.5 | 2.3 | 82.2 | 79.0 |
| 80 | 98.0 | 1480.7 | 89.4 | 6.8 | 82.6 | 2.7 | 79.9 | 76.3 |
| 81p | 102.0 | 1509.6 | 91.2 | 8.1 | 83.1 | 3.1 | 80.0 | 74.4 |

Sources and Notes:

1. Base case energy use, $E_1$, is developed by extrapolating 1972 energy consumption (71.630 quads; see Note 8) by an average annual growth rate of 4.0 percent per year. This base case methodology assumes constant energy use per unit of GNP, fixed at the 1972 level, and a GNP growth rate of 4.0 percent per year (in terms of 1972 constant dollars), which equals the historical rate observed from 1960 through 1972.

2. Constant dollar GNP (1972 $) data are from the Economic Report of the President, 1981, and preliminary data for 1981 are from Economic Indicators, Joint Economic Committee, U.S. Congress, February 1982, as provided by the Bureau of Economic Analysis, U.S. Department of Commerce.

3. Energy use adjusted for actual GNP growth, $E_2$, is developed by scaling 1972 energy use per unit of constant 1972 dollar GNP by the increase or decrease in GNP as it actually occurred.

4. The "energy reducing" effects of increased energy prices, $dE_3$, is derived from a statistical regression formulation of energy use in the U.S. economy, involving the regression variables of time, energy price, and GNP. The amount is quantified by taking the difference between two parametric "runs" of the regression model. The first allows all variables to change as they actually occurred, but holds energy price constant at 1972 levels. The second allows all variables to change as they actually occurred, including the changes in energy prices. The regression formulation is documented in "Energy Use from 1973 to 1980: The Role of Improved Energy Efficiency," (ORNL/CON-79), Oak Ridge National Laboratory, Equation #5, page 50, December 1981.

5. Energy use adjusted for both price and the slowdown in GNP growth, $E_3$, is developed by subtracting from $E_2$, the statistically derived reduction in energy use due to increased energy prices, $dE_3$.

6. The "energy reducing" effects of the continuation of historical trends in improving energy efficiency, not directly correlated to increased energy prices or to variations in GNP, $dE_4$, is derived from the same statistical regression formulation noted in Note 4. The amount is quantified by again taking the difference between two parametric "runs." The first allows all variables to change as they actually occurred, but holds the variable of time constant at 1972. The second allows all variables to change as the actually occurred, including the progression of time through 1981.

7. Energy use further adjusted for historcial trends, $E_4$, is developed by subtracting from $E_3$ the statistically derived reduction in energy use due to these trends, $dE_4$.

8. Actual energy use is from the Annual Report to Congress, Volume 2, 1980, and from the Monthly Energy Review, March 1982, both from the Energy Information Administration, U.S. Department of Energy.

## ENERGY TRENDS IN INDUSTRY
### (Energy Use in Quads)

| Year | Base[1] Case $E_1$ | FRB[2] Index M+M | Output[3] Adjusted $E_2$ | Shift[4] Factor $f_s$ | Adjusted[5] for Shift $E_3$ | Tech[6] Trend Factor $f_T$ | Adjusted[7] for Historical Trends $E_4$ | Actual[8] Energy Use $E_5$ |
|---|---|---|---|---|---|---|---|---|
| 72 | 27.9 | 118.5 | 27.9 | 1.000 | 27.9 | 1.000 | 27.9 | 27.9 |
| 73 | 29.0 | 128.8 | 30.4 | 0.998 | (30.5) | 1.008 | 30.3 | 29.5 |
| 74 | 30.2 | 128.4 | 30.3 | 1.014 | 29.9 | 1.016 | 29.4 | 29.7 |
| 75 | 31.4 | 116.1 | 27.4 | 1.014 | 29.9 | 1.024 | (26.4) | 26.5 |
| 76 | 32.7 | 128.2 | 30.4 | 1.010 | 30.1 | 1.032 | 29.2 | 28.2 |
| 77 | 34.0 | 137.0 | 32.3 | 1.029 | 31.4 | 1.041 | 30.2 | 29.0 |
| 78 | 35.3 | 145.3 | 34.2 | 1.036 | 33.0 | 1.049 | 31.5 | 29.3 |
| 79 | 36.7 | 151.7 | 35.7 | 1.048 | 34.1 | 1.057 | 32.3 | 31.4 |
| 80 | 38.2 | 145.8 | 34.4 | 1.066 | 32.3 | 1.066 | 30.3 | 30.2 |
| 81p | 39.7 | 149.8 | 35.3 | 1.080 | 32.7 | 1.074 | 30.4 | 29.3 |

Sources and Notes:

1. Base case industrial energy use, E1, is developed by extrapolating 1972 industrial sector energy use (27.923 quads; see Note 8) at an average annual growth rate of 4.0 percent per year. This growth rate assumes constant 1972 base year efficiencies per unit of industrial sector output and a historical growth rate of industrial output of 4.0 percent per year, which equals that for the 1953-1972 period, as measured by the Federal Reserve Board's index of industrial production for mining and manufacturing (excluding gas and electric utilities). The FRB's indexes for 1953 and 1972 are [illegible] and 118.5 respectively.

2. Data for the Federal Reserve Board's index of industrial production for mining and manufacturing for the years 1972 through 1981 are from the Economic Report of the President, January 1981, and from Industrial Production, Publication G.12.3, Board of Governors of the Federal Reserve System, March 16, 1982.

3. Energy use adjusted for changing industrial output, $E_2$, assumes constant 1972 base year energy efficiencies per unit of industrial output and is developed by scaling 1972 industrial sector energy use (27.923 quads) by the FRB index for mining and manufacturing.

4. The shift factor, $f_s$, is a cumulative measure of structural shifts in the mix of industrial output either toward or away from energy consumptive industries. It is derived by comparing the annual increases or decreases in two aggregate measures of industrial production for 472 mining and manufacturing industries. The first is a value-added weighted index. The second is an energy consumption weighted index. The underlying data on industrial production are from the Census of Manufacturing and Mineral Industries, U.S. Department of Commerce, and Industrial Production, Federal Reserve Board. A more detailed analysis of this phenomena is presented in a paper in process by R. Marlay, entitled "Industrial Energy Productivity, 1954-1980," researched at the Department of Nuclear Engineering, Massachusetts Institute of Technology, while on leave of absence from the U.S. Department of Energy.

5. Energy use adjusted for shift away from energy consumptive industries, $E_3$, is developed by dividing $E_2$ by $f_s$.

6. The technological trend factor, $f_T$, is developed by observing the apparent and improving trend in energy use per unit of industrial output (energy weighted index) from 1954 through 1972. This trend, revealed in a period of declining real energy prices, is observed to be about 0.8 percent per year, and is assumed to continue at the same rate in the post-1972 period.

7. Industrial sector energy use, as adjusted further for the continuation of historical trends in the improvement in energy efficiency, $E_4$, is developed by dividing $E_3$ by $f_T$.

8. Actual industrial sector energy use, $E_5$, is from the Annual Report to Congress, Volume 2, 1980, and the Monthly Energy Review, March 1982, both from the Energy Information Administration, U.S. Department of Energy.

## ENERGY TRENDS IN PASSENGER CARS
(Energy Use in Quads)

| Year | Base Case | Decrease in Car Use | Increased Operating Efficiency | Increased New Car MPG | Actual Energy Use |
|---|---|---|---|---|---|
| 72 | 9.2 | 9.2 | 9.2 | 9.2 | 9.2 |
| 73 | 9.6 | 9.7 | 9.7 | 9.7 | 9.7 |
| 74 | 10.0 | 10.3 | 9.5 | 9.3 | 9.3 |
| 75 | 10.3 | 10.7 | 10.0 | 10.0 | 9.8 |
| 76 | 10.7 | 11.0 | 10.3 | 10.1 | 9.7 |
| 77 | 11.1 | 11.4 | 10.7 | 10.5 | 9.9 |
| 78 | 11.5 | 11.7 | 11.5 | 11.3 | 10.4 |
| 79 | 11.9 | 12.0 | 11.2 | 10.9 | 9.8 |
| 80 | 12.3 | 12.1 | 10.7 | 10.4 | 9.2 |
| 81p | 12.7 | 12.3 | 11.1 | 10.8 | 8.8 |

**Sources and Notes:**

1. Using 1960-1972 data on passenger car registrations from R.L. Polk, an estimate was made of the historic growth rate in vehicle stock. Using 1972 as a base year, this growth rate was projected for the 1973-1981 period to produce a base case stock estimate. Base case consumption was then calculated using the constant efficiency of 13.0 MPG and growth in per car travel of 1% per year (see the referenced report in Note 2 for an explanation of these assumptions). In those years where base case stock exceeds actual stock ('80 and '81), the related consumption difference is shown as the effect of reduced car stock.

2. The energy saved due to a decrease in car use was calculated as a residual in the referenced report "Causes of Reduced Automobile Fuel Demand and its Implications for Consumers" by Difiglio and McNutt (formerly titled "Passenger Car Fuel Demand Reduction - An Analysis of the Causes and Implications"). The major assumption affecting the calculation was an assumed historic growth in vehicle miles of travel per car of one percent per year. The difference between this and actual growth in travel produces the change in vehicle miles travelled (vmt), which in turn produces the estimated savings.

3. The increased operating efficiency savings were derived from estimates of the impact of the 55 MPH speed limit and from analysis of household gasoline purchase and vehicle use diary records as described in the referenced report in Note 2.

4. Savings due to increased efficiency of new cars was calculated by holding fleet efficiency constant at a pre-1972 trend level of 13.0 MPH and then comparing that to actual fleet efficiency changes due to the introduction of new more efficient cars, as described in the referenced report in Note 2.

5. Actual passenger car energy use was derived from the 5th and 6th Quarterly Reports on the Highway Fuel Consumption (HFC) Model as described in the referenced report in Note 2. The HFC model provided a breakdown of gasoline and diesel fuel use by vehicle type and is calibrated against aggregate data of the Federal Highway Administration, U. S. Department of Transportation, the Energy Information Administration, and the U. S. Department of Energy.

## ENERGY TRENDS IN RESIDENTIAL BUILDINGS
(Energy Use in Quads)

| Year | Base Case A | Adjusted for Improved Building Shell Efficiency B | Adjusted for Improved Appliance Efficiency C | Adjusted for Demographic Factors D | Adjusted for Increased Use of Wood E | Adjusted for Curtailment Activities F |
|---|---|---|---|---|---|---|
| 72 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 |
| 73 | 15.30 | 15.30 | 15.30 | 15.30 | 15.30 | 15.10 |
| 74 | 15.80 | 15.68 | 15.66 | 15.66 | 15.36 | 14.80 |
| 75 | 16.30 | 16.14 | 16.14 | 16.11 | 15.74 | 14.90 |
| 76 | 16.90 | 16.61 | 16.60 | 16.56 | 16.15 | 15.40 |
| 77 | 17.40 | 17.05 | 17.00 | 18.94 | 16.49 | 15.70 |
| 78 | 17.90 | 17.51 | 17.42 | 17.35 | 16.85 | 16.00 |
| 79 | 18.50 | 18.08 | 17.92 | 17.86 | 17.30 | 15.40 |
| 80 | 19.00 | 18.49 | 18.25 | 18.17 | 17.52 | 15.50 |

Sources and Notes:

1. Base Case (Column A): Linear least squares best fit of residential energy consumption trends 1960-1972. The equation of the least squares fit: Y = 23.71 + 0.534X; Where Y = residential energy consumption (quads), and X = year (last two digits). Energy consumption data 1960-1972 from State Energy Data Report DOE/EIA, September 1981.

2. Improved Building Shell Efficiency (To derive the raw building shell efficiency numbers, subtract Column B from Column A, i.e., Column A - Column B): Data from analysis done by M.J. King, D.B. Belzer, et. al. of Pacific Northwest Laboratory "An Analysis of Changes in Residential Energy Consumption, 1973-1980," Draft Report, April 1982, pages 10-15.

3. Improved Appliance Efficiency (Column B - Column C): Data from M.J. King, D.B. Belzer, et. al, pages 18-24.

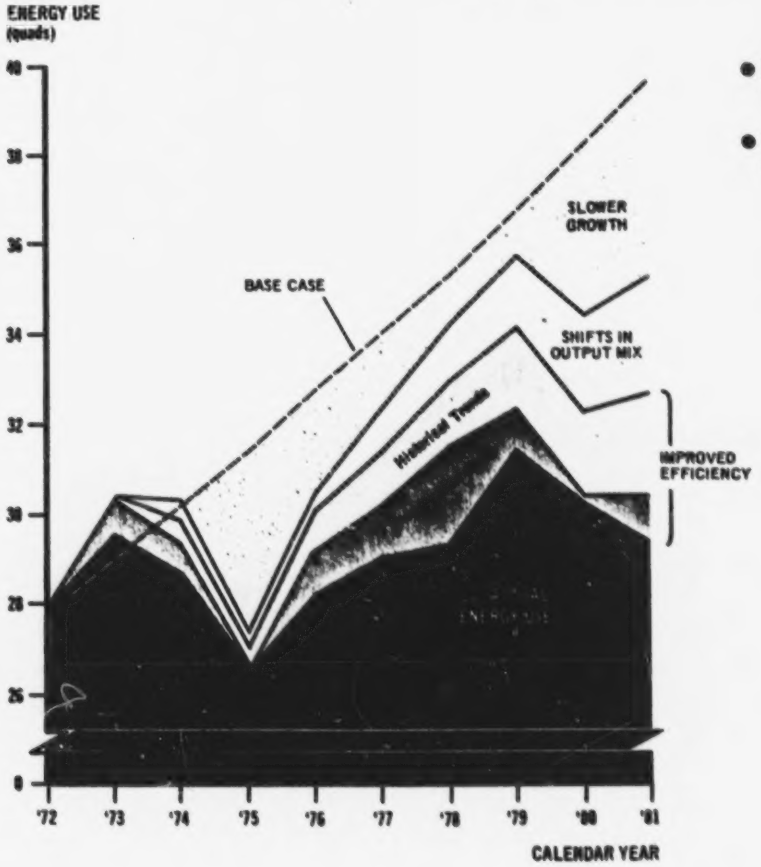
4. Demographic Factors (Column C - Column D): Household migration data from M.J. King, D.B. Belzer, et. al, pages 16-17. Analysis of shifts to small households based on data from Annual Housing Survey 1973-1980, Bureau of the Census. Shift measured by constructing a baseline of housing patterns holding 1973 housing patterns and energy use in each different type of housing unit constant. The baseline was then compared to actual housing patterns, keeping energy use constant, i.e. Shift to small household = [Baseline (1973 household mix, constant energy use)] - [Actual household mix (constant energy use)].

5. Increased Use of Wood (Column D - Column E): Data from "Alternative Energy Data Summary for the United States," Resource and Technology Management Corporation, 1981.

6. Curtailment Activities (Column E - Column F): This is a residual, what remains after the other components of energy conservation have been accounted for. If there are other unmeasured components, they will also be in this residual. However, every effort has been made to include all significant components and, thus, this residual is believed to account for the net effect of reliably curtailment activities.

7. Actual Energy Use (Column F): Data from State Energy Data Report, Energy Information Administration, U. S. Department of Energy, (DOE/EIA - 0214(79)), September 1981, updated to 1981 by the Energy Information Administration.

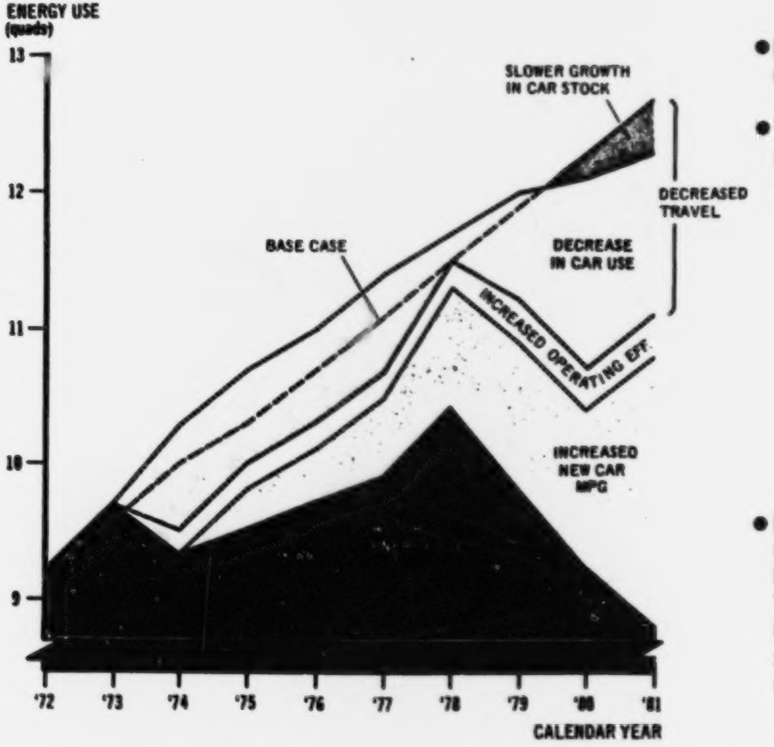
# Energy Trends in Industry



- **ENERGY USE** in 1981 was down **10.4 quads** from the base case.
- These **ENERGY SAVINGS (26%)** result from several factors:
  - **SLOWER GROWTH (4.4 quads)**....industrial output slowed from **4.0%** per year to **2.6%** per year after 1972;
  - **SHIFTS IN OUTPUT MIX (2.6 quads)**...depressed output among large energy using industries (steel, cement, chemicals, aluminum, paper) is offset by increased growth in lighter manufacturing (textiles, fabrication of aircraft and machinery parts, computers, and food processing);
  - **IMPROVED ENERGY EFFICIENCY (3.4 quads)**... new technologies and better energy management. Part is due to the **HISTORICAL TRENDS (2.3 quads)** in improving energy efficiency associated with capacity expansion and capital stock turnover; the remainder is due to **ACCELERATED GAINS (1.1 quad)** in improved efficiency associated with higher energy prices.

Source: R. Marlay, Office of Policy, Planning, and Analysis, U.S. Department of Energy. Analysis based on data from the Board of Governors of the Federal Reserve System, the U.S. Department of Commerce the Energy Information Administration, and on "Industrial Energy Productivity, 1954-1980," Massachusetts Institute of Technology, Cambridge, MA.

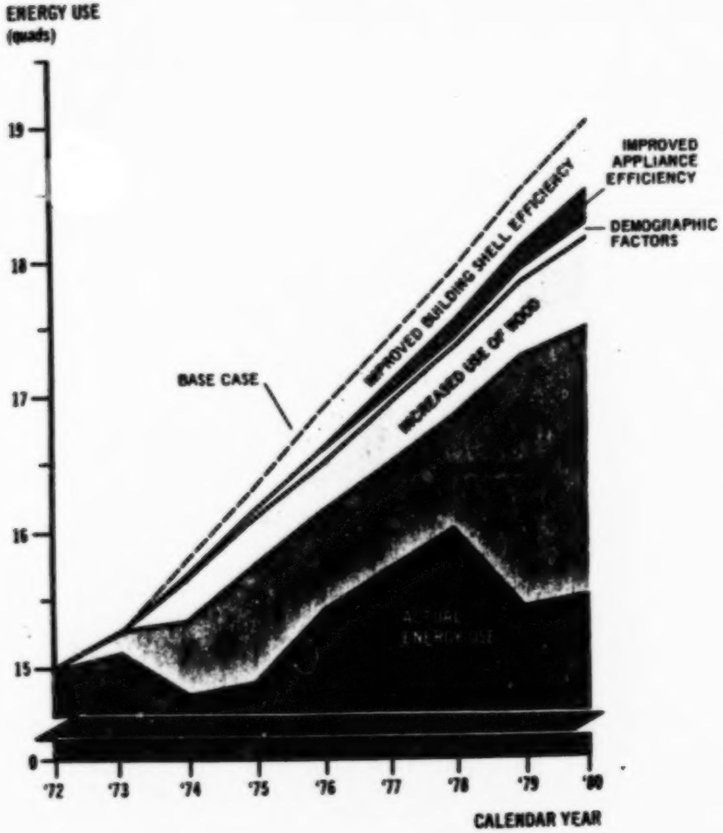
# Energy Trends in Passenger Cars



- **ENERGY USE** by passenger cars in 1981 was down **3.9 quads** from the base case.
- These **ENERGY SAVINGS (32%)** are the result of a number of factors:
  - **DECREASED TRAVEL (1.6 quads)**..due to slower growth in car stock and decreases in use per car.
  - **INCREASED OPERATING EFFICIENCY (0.3quads)**..brought about by better driving, improved auto maintenance and reduced speeds.
  - **INCREASED NEW CAR MPG (2.0quads)**..from technological improvements and decreased vehicle size (increased small car sales).
- During this time a number of factors were affecting energy use including a doubling of **FUEL PRICES**, increasing **FOREIGN COMPETITION**, **TECHNOLOGICAL ADVANCES** and **FEDERAL PROGRAMS** (55mph speed limit, fuel economy standards, and new car and driver efficiency information programs).

Source: C.Difiglio and B.McNutt,Office of Policy, Planning and Analysis, U.S.Department of Energy. Analysis based on data of the Energy Information Administration, U.S. Department of Transportation on work of the Oak Ridge National Laboratories, Oak Ridge, TN, and on a study by the authors, entitled **"Passenger Car Fuel Reduction – An Analysis of the Causes and Implications."**

# Energy Trends in Residential Buildings



- **ENERGY USE** in 1980 savings was down 3.5 quads from the base case.
- These **ENERGY SAVINGS (18%)** result from several factors:
  - **IMPROVED BUILDING SHELL EFFICIENCY (0.5 quads)**-- achieved by retrofitting old homes with conservation measures such as insulation, storm doors, caulking, and weatherstripping; and building more energy efficient new homes;
  - **IMPROVED APPLIANCE EFFICIENCY (0.2 quads)**-- achieved by replacing old appliances with more efficient models; and installing energy efficient models in new homes;
  - **DEMOGRAPHIC FACTORS (0.1 quad)**-- migration from colder to warmer climates; and shifts to smaller household units;
  - **INCREASED USE OF WOOD (0.7 quad)**-- as a substitute for conventional home-heating fuels;
  - **CURTAILMENT ACTIVITIES (2.0 quads)**-- including temperature setbacks, room shutoffs, and reduced appliance use.

Source A. Gravitz, Office of Policy, Planning and Analysis, U.S. Department of Energy. Energy use data from **State Energy Data Report** DOE EIA, September 1981. Building shell and appliance efficiency data from "**An Analysis of Changes in Residential Energy Consumption, 1973–1980**," Draft report, March 1982. Pacific Northwest Laboratories. Demographic factors data from **Annual Housing Survey**, Bureau of the Census. Wood use data from "**Alternative Energy Data Summary for the United States**," Resource and Technology Management Corporation. 1981

## U. S. ENERGY USE BY SECTOR

## 1981

| | Quads | | % of Total | |
|---|---|---|---|---|
| Industrial Energy Use* | | 29.3 | | 40% |
| Transportation Energy Use | | 18.7 | | 25% |
| Passenger Cars* | ( 8.8) | | (12%) | |
| Trucks and Airplanes | ( 5.9) | | (8%) | |
| Other | ( 4.0) | | (5%) | |
| Buildings Energy Use | | 26.4 | | 35% |
| Residential Buildings* | (15.0) | | (20%) | |
| Commercial Buildings | (11.4) | | (15%) | |
| Total U. S. Energy Use* | | 74.4 | | 100% |

*Sectors and subsectors covered in this analysis.

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SOURCES: Monthly Energy Review, DOE/EIA, February 1982.

Transportation Energy Conservation Data Book: Ed. 5, DOE/ORNL, November 1981.

State Energy Data Report, DOE/EIA, September 1981, used for calculation of proportional energy use by residential and commercial sectors.

Mr. **Yates**. Is the Office of Policy, Planning and Analysis being cut back?

Mr. **Tribble**. I am sure it is.

Mr. **Yates**. I am sure it is too. Can we take this as a realiable study, even though it is cut back?

Mr. **Tribble**. Or will be.

Mr. **Yates**. If it furnishes such useful documents, why should it be cut back?

Mr. **Tribble**. Some things you can afford, and some things you can't.

Mr. **Yates**. I see. What impact do you think falling oil prices have on the individual or business as far as efficiency is concerned?

Mr. **Tribble**. I think that the general business community will recognize that—well, let me back up a little bit and start from a different point.

Mr. **Yates**. Sure.

Mr. **Tribble**. When energy prices first doubled and then quadrupled, the industrial sector began to do those things that we would term housekeeping things. Insulating, stopping heat losses in buildings, and making some improvements in processes. Things that could be done on a short-term time frame.

Most of those accounted for quite a lot of the conservation that has taken place. In more recent years, as those have become effective, now to further reduce energy consumption on a per unit of production basis is going to require substantial investment in capital equipment that will be more energy efficient, and that will perhaps change processes.

So, that we can look forward now to, I believe, a continuation of the improvement that has taken place in industry over the past 7 years. The fact is that industry now looks at present day fuel prices. These are long-term considerations by industry, by the individual companies, because as you know, there has to be preliminary engineering, capital jobs written and approved by the board of directors before they then get into the process.

So, this is on a long-term time frame. Certainly the current reduction in the cost of energy or the cost of oil will have an impact on those activities that are authorized by the various boards of directors, depending upon whether or not they use current prices in their justifications, or whether they use anticipated prices.

I would think that those that use anticipated prices would consider that the present decline in oil prices is somewhat of a temporary measure, and that looking down the road 5 or 6 years, when these capital expenditures would have taken place and would come on stream, that it is likely that the price of oil would have taken a different turn.

Mr. **Yates**. You mean an upward turn?

Mr. **Tribble**. Yes.

Mr. **Yates**. If your conclusion is right, why, then, should we be cutting back so drastically in conservation activities in the Department of Energy?

Mr. **Tribble**. Because the dollars spent in conservation in the Department of Energy bears very little relationship to the amount of conservation that is taking place in the Nation.

### SCHOOLS AND HOSPITALS

Mr. YATES. You talked about the return on investment. What about conservation for schools and hospitals?

Mr. TRIBBLE. I think the same influences will come into play, although, of course, the schools and hospitals are in a different posture in that they are not looking at a bottom line profit.

Mr. YATES. That is right. Should we eliminate that conservation measure, too?

Mr. TRIBBLE. We feel that there are other opportunities here. Let me mention one. This is premature, I might say, to discuss, because it is merely an effort that is going on in our Department. We don't know whether it will succeed or not. But I want you to know that we are not just trying to shut it off, and not have something we could do instead. We think that there is incentive for the Department of HHS to recognize activities on the part of hospitals where they do make an effort to conserve energy.

After all, we, the Federal Government, are paying a large part of that hospitalization cost. We think there is also some incentive on the part of the insurance companies to recognize and to conserve.

We would like to be able to bring about a recognition on the part of the insurance companies and the Federal Government of energy conservation measures that are taking place in hospitals so that the hospital boards themselves would see it in the interest of their organization to do these kinds of things.

Mr. YATES. Where are they going to get the money?

Mr. TRIBBLE. Well, they can get the money from——

Mr. YATES. If they get the money, then hospital costs are going to go up, and they are already the highest in history now.

Mr. TRIBBLE. Not necessarily.

Mr. YATES. That will be the day.

Mr. TRIBBLE. There are now companies that will go to a business and install conservation measures, and take as their remuneration a part of the utilities that are saved. We hear of a number of these springing up around the country in a number of places. We think this is something we would like to encourage because these companies will then go into a hospital, a business, a home, and install cost-effective measures. They will maintain them. It will be their money that is invested, and their return comes from the utility savings in the installation, in the place where the installation is made. It has a number of advantages in that the companies that are making the installation in the first place are going to put in cost-effective measures, only.

They are going to maintain them so that they will continue to create the benefit. And then there is no upfront cost on the part of the person or the organization. We think that this is a means whereby if this further developed, that these conservation measures can be done in schools and hospitals.

As a matter of fact, we are working toward a proposal whereby the Federal Government might benefit from this kind of thing. There might be companies that will be willing to come in and do conservation measures in buildings in the Federal sector, whereby we would then be able to get the conservation done without having to finance it.

So, there is some work going on. All of these things are taking place simply because there is money to be saved in conservation, and it is a cost-effective thing to do.

### ACTIVITIES OF FOREIGN GOVERNMENTS

Mr. **Yates**. How does our Government activity in the field of energy conservation compare with comparable activities by foreign governments? Is there activity by the Government of Japan, for example, in the energy conservation field?

Mr. **Tribble**. I personally don't know. We have some figures on that.

Mr. **Yates**. Dr. Savitz?

Ms. **Savitz**. Are you asking what they do with their own buildings or what they do in sponsoring research?

Mr. **Yates**. What does the Government of Japan do in order to promote energy conservation?

Ms. **Savitz**. They sponsor several research projects.

Mr. **Yates**. Do they only do research projects? Do they have a limited budget for this purpose? Who does it, primarily industry and individuals, or does the Government get involved?

Ms. **Savitz**. The Government funds it jointly with industry.

Mr. **Yates**. How much does it invest?

[The information follows:]

TOTAL FEDERAL GOVERNMENT R. & D. BUDGET FOR ENERGY CONSERVATION[1]

[Dollars in millions]

| | 1979 | 1980 | 1981 |
|---|---|---|---|
| United Kingdom | 34.7 | 27.6 | N/A |
| West Germany | 45.1 | 70.5 | N/A |
| Japan | 51.3 | 32.0 | 61.3 |
| Australia | N/A | 2.2 | N/A |
| Canada | 10.7 | 24.4 | 13.6 |
| Sweden | 34.2 | 34.1 | 45.7 |
| Netherlands | 14.5 | 23.6 | 22.3 |
| France | 80.9 | 92.4 | N/A |

[1] DHR, Inc., report dated Nov. 9, 1981, "Conservation and Solar Energy R. & D. Expenditures: An International Comparison."

### OIL DECONTROL AND OIL PRICES

Mr. **Yates**. Do they also have basically decontrolled prices on energy?

Ms. **Savitz**. They have high taxes. They are decontrolled and they also have additional taxes. Gasoline in Europe is often $2.50, $3.00 a gallon.

Mr. **Yates**. They don't have falling oil prices then, do they?

Ms. **Savitz**. As the world market drops, their price would drop also.

Mr. **Yates**. Do they permit prices to drop or do they raise the level of taxes correspondingly to make sure there isn't greater use?

Ms. **Savitz**. I do not know.

Mr. **Yates**. Our oil prices have been falling to some degree. Mr. Tribble said that as decontrol came in, the prices went up, which was a great factor toward energy conservation. Did I misunderstand your statement?

Mr. **Tribble**. No. As a matter of fact when decontrol came on, prices went down. What I said, I believe, was that back when——

Mr. **Yates**. When decontrol went on prices went up immediately. You are saying that now prices have come down, but that is not because of decontrol, but because of the oil glut.

Mr. **Tribble**. I don't believe I have addressed that question before. But, I think I did say in the early years of the decade of the 1970's when the price did escalate rapidly, then the activity in industry particularly took place to effect conservation. As a practical matter, I believe if we look at the price of oil, the price of it has come down since decontrol took place.

Mr. **Yates**. I do not think there is any question about that. If you look at the price of oil immediately following decontrol, I think you will see that the price went up. Is my memory correct on that? Do you remember that, anybody?

Mr. **Chiogioji**. It did go up.

Mr. **Yates**. It did go up. Then as more oil came to the market, I think the prices started to come down.

### OIL IMPORT FEE

What is your view on the oil import fee? Would it help conservation?

Mr. **Tribble**. I am not qualified to give you an opinion on that.

Mr. **Yates**. All right. Well, if you are not, who will be?

Mr. **Tribble**. That would be certainly a Treasury question. I could answer to the effect that in the context that higher prices would create a greater incentive for conservation, higher prices from any source would have that same effect.

But, as to the merits of an import fee, that is the thing that I think I am not qualified to discuss.

Mr. **Yates**. That question was addressed to the aspect you answered.

### PERSONNEL LEVELS

On page 12 of your justification, it is shown that for energy conservation, permanent employment for 1981 was 415 people. For 1982 it was 105 and for 1983 it moves down to 29. Yet, on page 31 you show 36 positions for research programs. And on page 27 you show 62 for grant programs. What is your correct request for personnel?

Mr. **Tribble**. The request for personnel would be the 1983 estimated number on an FTE basis. That would assume, of course, that the 1983 budget was accepted.

Mr. **Yates**. So, the correct number is 29?

Mr. **Tribble**. I think that is right.

Mr. **Yates**. You have different numbers in different places.

Mr. **Tribble**. Let us see if that includes State and local. I do not believe it does.

Mr. **Yates**. All right. The number is 29?

Mr. **Tribble**. Yes. The 29 is in conservation, and then there are none in State and local.

So the 29 is the end-strength. On the other hand, the FTE's would be 36 in conservation, and 62 in State and local, but those would be phased out over the year as the program is drawn to a close. This is FTE rather than end strength.

Mr. **Yates**. Does that mean you are starting out at 62 but at the end of the year that goes down to zero?

Mr. **Tribble**. Yes. It would start at 62 and remain level through the year, with all 62 employees terminating on September 30. In conservation, on the other hand, we will start the year at 43 and end at 29, using 36 FTE's, or staff years.

Mr. **Yates**. What staff level do you expect to have at the end of fiscal year 1982? It would be zero for State and local at the end of 1983.

Mr. **Tribble**. The end of 1983, yes.

Mr. **Yates**. What staff level do you expect to have at the end of fiscal year 1982?

Mr. **Tribble**. Forty-three in conservation, 62 in State and local.

Mr. **Yates**. At the end of 1982?

Mr. **Tribble**. There is something wrong with that.

Mr. **Yates**. I think we better pass this temporarily.

Mr. **Tribble**. Yes.

Mr. **Yates**. During the lunch period I think you better try to reconcile it.

Mr. **Tribble**. This is admittedly confusing.

Mr. **Yates**. It is to us too, that is why we asked the question.

Mr. **Tribble**. Yes. Let me submit something for the record.

[The information follows:]

## WORK FORCE ALLOCATIONS

[Per fiscal year 1983 budget]

| | Fiscal year 1981 | | Fiscal year 1982 | | Fiscal year 1983 | |
|---|---|---|---|---|---|---|
| | End | FTE | End | FTE | End | FTE |
| Conservation: | | | | | | |
| Building R. & D. | 130 | 115 | 14 | 86 | 7 | 10 |
| Energy systems research | 35 | 33 | 11 | 27 | 10 | 10 |
| Vehicles R. & D. | 54 | 47 | 11 | 35 | 7 | 9 |
| Industrial R. & D. | 31 | 30 | 7 | 30 | 3 | 5 |
| DAS | | | | | 2 | 2 |
| Subtotal | 250 | 225 | 43 | 178 | 29 | 36 |
| State and local: | | | | | | |
| Headquarters | 64 | 60 | 15 | 25 | 0 | 15 |
| Field | 97 | 210 | 47 | 63 | 0 | 47 |
| Subtotal | 161 | 270 | 62 | 98 | 0 | 62 |
| Total | 411 | 495 | 105 | 276 | 29 | 98 |

### REDUCTION IN FORCE

Have you had to run a reduction in force?

Mr. **Tribble**. No reduction in force for the 1982 year. This was to meet the end strength. We did run one in 1981 to meet the end strength in 1981.

Mr. **Yates**. Do you expect to conduct one for 1983?

Mr. **Tribble**. If the budget is accepted as proposed, we would have to have a RIF in 1983.

Mr. **Yates**. How much of a RIF?

Mr. **Tribble**. Substantial. I do not know the numbers, because of course it would depend on the attrition rate between now and then.

Mr. **Yates**. Can you tell the committee what percentage of your current staff is occupying the same positions they held a year ago?

Mr. **Tribble**. About 200.

Mr. **Yates**. What percent would that be?

Mr. **Tribble**. About 33 percent.

Mr. **Yates**. Has this had any impact on your ability to run your programs effectively?

Mr. **Tribble**. Certainly it has an impact. There is no way to shift around this many people without it having an impact. On the other hand, I must say that the adjustments that have been made have been very good, and that the programs are continuing.

Mr. **Yates**. Well, suppose the Congress decides to continue your energy conservation programs at the 1982 level. What do you do about personnel?

Mr. **Tribble**. We have enough on board strength to operate at that level.

Mr. **Yates**. You do?

Mr. **Tribble**. Yes.

Mr. **Yates**. They are the ones that are going to be RIF'd in case it is necessary?

Mr. **Tribble**. Part of them.

## ENERGY CONSUMPTION IN BUILDINGS

Mr. **Yates**. A number of years back, your objectives were to reduce energy consumption in existing buildings by 20 percent, and in new buildings by 30 percent by 1985. What progress has been made in meeting these objectives?

Mr. **Tribble**. A number of the agencies have submitted plans, and a number of them have been approved. A number of them are still requiring some adjustment for approval.

Mr. **Yates**. The goal was not only Federal buildings. The goal was all buildings, private as well.

Mr. **Tribble**. I am sorry. I didn't follow you.

Mr. **Yates**. The goals that were announced were for reducing energy consumption in all existing buildings by 20 percent, and in new buildings by 30 percent by 1985. Are you anywhere near that?

Mr. **Tribble**. Yes. In the 1980, compared to 1965, I think the energy consumption per household is down 20 percent. Isn't that right?

Ms. **Savitz**. Fourteen percent.

Mr. **Tribble**. I would like to answer that for the record.

Mr. **Yates**. Okay.

Mr. **Tribble**. Because I feel like I have that number from somewhere. I would like to verify it.

[The information follows:]

### ENERGY EFFICIENCY INCREASES

Current estimates show a range of efficiency improvements of 14 to 20 percent since 1972 in residential buildings. Energy use has been reduced approximately 11 to 12 percent in commercial buildings over the same period.

DOE research also indicates that heat pump efficiency has risen 20 percent over the last several years. The amount of energy used for lighting has not increased over the last few years. During this time, several types of more efficient lighting equipment have been developed—a flourescent ballast that is 20 percent more efficient, and a high intensity discharge (HID) ballast that is 10 to 15 percent more efficient are two examples. DOE has had a major impact on the rapid development of these products through cost-shared projects with several manufacturers. The flourescent ballast is now available on the market from a number of manufacturers. A light bulb currently in development is expected to be 300 percent more efficient than the standard incandescent type. DOE has also funded cost-shared work on this technology with several manufacturers.

### HEAT PUMP EFFICIENCY

Mr. **YATES**. What progress have you made toward improving the energy efficiency of the advanced electric heat pump and refrigeration systems by 35 percent in 1992? You are wondering where we got that figure, right?

Ms. **SAVITZ**. Yes.

Mr. **YATES**. We got it from you.

Ms. **SAVITZ**. The heat pump water heater is on the market now which improves water heaters 50 percent. On electric heat pumps, I know—I can't remember the exact numbers but the COP has gone up as they have introduced new——

Mr. **YATES**. Do you want to put that in the record?

Ms. **SAVITZ**. Yes.

[The information follows:]

### HEAT PUMP EFFICIENCY

DOE has worked with Westinghouse in a cost-sharing effort to develop an electric heat pump with a 20 percent increase in efficiency over the best heat pump now on the market. There is a potential, with improvements in control and reduction in frosting and defrosting and cycling losses, for an additional 5 percent increase in efficiency. However, the work with Westinghouse is being discontinued with the fabrication and testing of two prototype units, due to redirection of DOE programs away from product-specific development and to Westinghouse's decision to withdraw from the residential unitary heating and cooling business.

### LIGHTING SYSTEMS

Mr. **YATES**. What about improvement of energy efficiency of lighting systems by 25 to 35 percent by 1995?

Ms. **SAVITZ**. That would mean large market penetration. Things such as solid state ballasts, will improve flourescent lighting by 25 percent or more. There are more than ten companies that make those products now and several hundred thousand units have been sold. They are Circline flourescent light that you screw into your Edison light socket. I think there are new products on the market——

Mr. **YATES**. Would that help?

Ms. **SAVITZ**. Yes. Both for lighting, the light bulbs themselves, and also the ballasts that will meet that goal, because there are several products and they are being sold.

Mr. **Yates**. If the programs are terminated at the end of 1982, will you still feel you will be able to meet those same objectives by those same times?

Ms. **Savitz**. One would have to do an analysis—in the lighting, yes. Products are ready for the market now.

In some of the others, we have to do an analysis of how many new products will come into the market and what the private sector will pick up.

### ENERGY RESEARCH ADVISORY BOARD RECOMMENDATIONS

Mr. **Yates**. All right.

What is your assessment of the Energy Research Advisory Board's comments on the need for building and community system research?

Mr. **Tribble**. Generally the recommendations were that we spend more money on conservation. They have formed a new committee on conservation. We have asked them to come forward with more specific recommendations that we could then evaluate.

Generally speaking, their recommendations were of a general nature.

### BUILDING INDUSTRY RESEARCH

Mr. **Yates**. We have a housing slump and have had for some years. Do you believe the building industry is going to fund research?

Mr. **Tribble**. Well, we have done a great deal of research on determining the factors that go into making a building energy efficient. As I mentioned earlier, the stock of buildings that were built prior to 1973 were built, of course, when energy was inexpensive and there was little incentive to put in energy conservation measures. That has changed now in that the buildings that are being built now, of course, are more energy efficient and there is substantial incentive to continue to improve this.

On the other hand, the know-how is available. We do know how to build buildings that are quite energy efficient, and so that it becomes a matter of economics as to how much money the purchaser is willing to invest for conservation measures.

Mr. **Yates**. Is there any indication that the private sector will continue building for energy efficiency?

Mr. **Tribble**. When you say research for building efficiency——

Mr. **Yates**. You say there is a lot that has already been achieved.

Mr. **Tribble**. We have done a great deal.

Mr. **Yates**. But there are still avenues of research that ought to be pursued. In view of the fact that the Government is dropping this field of research, is there any indication private industry will pick it up?

Mr. **Tribble**. Certainly there will be continued research. For example, the insulation companies will continue to develop improved insulation. The building suppliers will, of course, have this in mind. Now they are going toward an extra layer of insulation on the outside of a frame house. This is not research. This is simply the application of technology that is already available.

Building associations have expressed an interest in continuing this kind of work, but I do not have the numbers to tell you how much any one of them may be willing to invest. As you know, ASHRAE continues to upgrade their standards as new developments come on the market. This, of course, is a concensus process. The American Institute of Architects has instituted a rather extensive program of informing the architects of the country in energy conservation matters. Still again, I come back to the question, I am really not answering your question about will they pick up the research.

Mr. YATES. We will just have to wait and see, won't we? There is no indication that they are doing it?

Ms. SAVITZ. The Gas Research Institute is the only one I know who is planning to increase——

Mr. YATES. They have been doing that for years.

Ms. SAVITZ. They are planning to increase their amount of money for energy efficiency utilization to pick up some of the field testing of the building equipment we have been developing.

### BUILDING ENERGY PERFORMANCE STANDARDS

Mr. YATES. Have there been any lawsuits involved in building energy performance standards?

Ms. SAVITZ. Not building energy performance standards. There have been for appliance standards.

### APPLIANCE STANDARDS

Mr. YATES. Appliance standards? Have you issued regulations requiring appliance standards?

Ms. SAVITZ. We have just reissued a proposed rule in response to the requirement for us to issue standards for eight household appliances.

Mr. YATES. No standards are good standards at DOE. Is that what you are saying?

Ms. SAVITZ. Yes, that is our finding.

### LABELING PROGRAM

Mr. YATES. That is your finding. Didn't Secretary Edwards testify before us last year about a new refrigerator he had bought that was so energy efficient that the manufacturer had put a yellow label on it showing that this refrigerator——

Ms. SAVITZ. We support the labeling program.

Mr. YATES. Yes, I can understand that. Wasn't there also a requirement that certain fuel efficiency standards be maintained pursuant to a rule or regulation by the Department of Energy?

Ms. SAVITZ. Yes, that is what this regulation——

Mr. YATES. I thought you were eliminating that now. You are saying no standards are good standards.

Ms. SAVITZ. Right, but the labeling gives information about how much energy that product will use relative to other products, but doesn't require a minimum efficiency level.

Mr. YATES. So, you will permit labeling?

Ms. SAVITZ. Yes.

Mr. **Yates**. Is there a rule requiring labeling?

Ms. **Savitz**. Yes, we do the test——

Mr. **Yates**. How can you continue to have a rule requiring labeling?

Ms. **Savitz**. There are two separate parts of the act.

Mr. **Yates**. I know but why have any rules or any regulations? I thought that the DOE now was not going to have any regulations. You are eliminating regulations.

Mr. **Tribble**. I do not know that we would be able to go all the way.

Mr. **Yates**. Why not? "No standards are good standards", says DOE in hearings before our subcommittee last year for fiscal year 1982, part 7, page 175.

"Mr. **Yates**. Let's take one of the items being cut back, the question of conservation that would come through government aid for appliance information. That is right, isn't it?

"Secretary **Edwards**. Yes, labeling.

"Mr. **Yates**. Would you in conference with Mr. Stockman reconsider something like that and possibly the other items? I am going to point to a statement that Mr. Stockman made which appears in the legislative history for the 95th Congress, January 1979, page 8922.

"Mr. Stockman said: 'Now that consumers are faced with a sharply-rising cost of electricity, the central policy choice for Congress is whether to rely on market forces alone.' You just got through telling me you are going to rely on market forces.

"The **Secretary**. For the most part. We do have some money for conservation, however." That was last year; you don't have very much left now, do you?

"Mr. **Yates**. I know. You have $200 million left." A lot of money last year. I think we put more in, didn't we?

Ms. **Savitz**. Yes.

Mr. **Yates**. Yes. How much did we raise it? We raised it from $200 million to $383 million. Here is what Mr. Stockman says about the market forces you are talking about. "There is some reason to doubt that market forces alone will bring about the needed shift to more effective appliances." This is Mr. Stockman. Do you agree with that statement?

Mr. **Tribble**. I think the facts of the matter since then have demonstrated substantial improvements in appliance efficiency in response to the demand for more efficiency.

Mr. **Yates**. But we are faced with higher electricity prices in the foreseeable future, aren't we?

Mr. **Tribble**. Yes.

### ENERGY EFFICIENCY STANDARDS

Mr. **Yates**. Yes. Doesn't it make sense to continue regulatory standards for efficiency, then?

Mr. **Tribble**. I think that the——

Mr. **Yates**. What you are saying is that conditions have changed, and that market forces alone can now require the kind of efficiencies that we hope for. That is really what you are saying, isn't it?

Mr. TRIBBLE. I think we found that the difference between what the market would bring about and what standards would bring about was quite small.

Mr. YATES. Mr. Stockman also said: "A third reason that would support a regulatory approach is that appliances in many new residential units are not purchased by the user, but are purchased by the builders who will continue to seek appliances with the lowest initial cost without regard to increasing electric rates."

That is his market force. Builders are going to continue to buy the cheapest refrigerator. As he builds, 50 or 100 homes, he is going to look at the cost of the appliances, not at efficiency. He is going to look at the refrigerator that will let him sell his house for the lowest price. Isn't that correct?

Mr. TRIBBLE. That certainly is what is implied from that statement.

Mr. YATES. Yes.

Mr. TRIBBLE. I think on the other hand, experience since that time has demonstrated that the builders are in fact paying a great deal of attention to the efficiency of the facilities that they have put in.

Mr. YATES. I read on, page 176: Mr. Chairman says to Secretary Edwards, "Mr. Stockman has been leading the charge against such kinds of regulations.

"The SECRETARY. Mr. Chairman that is an area that Mr. Stockman and I are not in agreement on. I just happened to buy a refrigerator the other day, Mr. Chairman. Right on the front was a big yellow label and it had the cost basis of so much per kilowatt hour, and how much it would cost to operate that particular refrigerator for a year.

"Mr. YATES. Weren't you glad to have that?

"Secretary EDWARDS. It was a pretty good thing.

"Mr. YATES. The reason you have it is because that was required by the Congress. Now, you don't want to enforce that.

"Secretary EDWARDS. However, you said the information was not there, and the information happened to be on there but it was put out by the company.

"Mr. YATES. It will not be there if your reduction goes through. Within the $700 million being cut, one of the items is from the department or bureau that is responsible for requiring that information to be put on that refrigerator.

"Secretary EDWARDS. Mr. Chairman, we feel and I feel that the private sector would continue that operation so the people would know which one was best. It is a good sales promotion."

Yet we know that most of the refrigerators will be bought by builders at such time as the housing market ever comes back, won't they? Because there will be a big housing surge. There has got to be. They are going to buy the cheapest refrigerators. You don't think so?

Mr. TRIBBLE. No, I don't agree with that.

Mr. YATES. You don't. Well, maybe we ought to bring some builders in here and have them testify because I would think builders, in looking at what will be the best sales pitch for their prospective customers will have to decide whether it is lower price, or whether they can get more customers by saying we have more efficient refrigerators, but they cost more.

Mr. **Tribble**. I think that is exactly right. They will have to strike that balance.

Mr. **Yates**. Here is a book entitled, "The Critical Link." by Charles K. Ebinger, Project Director, forward by Henry A. Kissinger. You know immediately it is a very distinguished book.

On page 44 there is a chapter on oil and gas conservation in households and businesses. In it he says, "Under the authority of NECPA, DOE has proposed minimum efficiency standards for gas- and oil-burning furnaces and boilers. This program would require manufacturers to produce oil furnaces and boilers with an efficiency of at least 75 percent commencing in 1981 and no less than 80 percent in 1986."

Do you recall that?

Ms. **Savitz**. Yes.

Mr. **Yates**. I agree, it isn't a refrigerator, but we are talking about a comparable appliance that goes into a house.

The standard for gas boilers and furnaces would be 65 percent in 1981 but roughly 80 percent by 1986. Then it says: "Although manufacturers already produce a variety of high-efficiency furnaces and boilers ranging from 75 percent to 90 percent efficiency, they continue to make a relatively inexpensive low-efficiency model, the 'builder-model' lines, that contractors typically install in new houses. If the federal government required that all furnaces and boilers meet a relatively high standard for fuel economy, contractors no longer would have access to the cheap builder-model lines. Thus DOE's program addresses a significant quirk in the current housing construction system that tends to counteract efforts at fuel conservation in building."

If they give a builder the opportunity to choose a fuel efficient appliance that is more expensive or one that is cheaper, you think he will choose the one that is more expensive because it is more efficient?

Mr. **Tribble**. I think the American public is a great deal more sophisticated in matters like that than that report gives them credit for being, because I think that the utility bill has gotten their attention. I think that any buyer that goes out to buy a house now will certainly want to know what the efficiency of the furnace is, or at least have an idea of whether or not it is a good one or not so good.

Mr. **Yates**. Let's continue with what Secretary Edwards said: "However, you said the information was not there, and the information happened to be there but it was put out by the company.

"Mr. **Yates**. It will not be there if your reduction goes through. Within the $700 million being cut, one of the items is from the department or bureau that is responsible for requiring that information be put on that refrigerator.

"Secretary **Edwards**. Mr. Chairman, we feel and I feel the private sector would continue that operation so that the people would know which one was best. It is a good sales promotion. That is the thing that made my wife go over there and look at it and buy that particular one.

"Mr. **Yates**. Your wife was absolutely right, and the best thing you did was to marry her.

"Secretary **Edwards**. Mr. Chairman, for the record, I want that underlined.

"Secretary **Edwards**. She has put up with me for 30 years in all sorts of new jobs that I have taken on.

"Mr. **Yates**. I know. You should have stayed on in the dentistry racket, shouldn't you?"

### BUILDING ENERGY PERFORMANCE STANDARDS

Mr. **Yates**. Well, what activity are you carrying on in 1982 in the building energy performance standards program?

Mr. **Tribble**. In 1982 building energy performance standards program, work is going forward at the Lawrence Berkeley Laboratory.

Mr. **Yates**. Is that the laser you were talking about?

Mr. **Tribble**. No.

Mr. **Yates**. What work is going forward?

Mr. **Tribble**. They are studying five prototypes, a one-story arranged house, a two-story, a split-level, an outside townhouse, and an inside townhouse. Energy savings information is being generated by LBL under the following headings: Both annual heating and cooling load and annual heating and cooling load energy, in Btu's.

LBL is analyzing the following conservation strategies: Fifteen combinations of insulation and glazing; variations in area of glazing; and variations in distribution of glazing; movable night insulation; shading of glass; variation in infiltration; different equipment efficiencies; and variations in building shape. All of this is with the objective of providing handbooks to the builders so that they can know what effect on energy efficiency of the building these various configurations of glazing and such will have.

Mr. **Yates**. All right. Will those programs be completed by the end of the fiscal year?

Mr. **Tribble**. Yes, they will.

Mr. **Yates**. They will be.

[**Committee note**.—Subsequent to the hearing, Mr. Tribble revised his answer to say that the programs will be completed using fiscal year 1982 funds, although research may continue until the end of the calendar year.]

Will that be adequate research of that type for those programs?

Mr. **Tribble**. This will certainly—well, this in conjunction with some of the other things that are being done. We are not just closing that out.

Mr. **Yates**. What will be continued?

Mr. **Tribble**. As the infiltration is reduced, you get into a circumstance where the buildup of impurities in the air can become a factor. We will be doing some work to determine how many air changes are needed.

Mr. **Yates**. Why do you do that? Why don't you let industry do it?

Mr. **Tribble**. This is work we feel it is justifiable for us to do.

## RESEARCH ON BUILDINGS

Mr. **Yates**. Where do you draw the line? Why don't you let industry do that work, and let them go out to the people and say, "We have an air conditioner that takes the impurities out of the air." Why should the Government do it, and not industry?

Mr. **Tribble**. One of the things that we think is worthwhile for us to do in the first place is that, as I mentioned earlier, the building industry is very fragmented. There are not very many organizations of the building industry that are going forward with research. And there are some things that we think that we can do that will be a good investment and that we should do.

One of those is to come up with relatively inexpensive instruments that will assist us in determining whether or not the air is satisfactory. Other work that has been done already, and is available, is work on heat exchangers whereby the air that is brought in for make up air will be heated by the air that is exhausted.

The one other thing that has been done that is now available is a computer model that, if you input the factors that constitute the design of the building, the computer model will give you back the energy efficiency of the building. And this model has been developed to the point where it can be used on a relatively inexpensive computer. We do want to go forward with that work so that it can be made more available and can be used on even less sophisticated computers.

Those are things that we would not expect the building industry to do. We do feel that it is in the national interest to do these things, and we think that they are worthwhile expenditures.

Mr. **Yates**. The work that is now going on under LBL.

Mr. **Tribble**. Yes, Lawrence Berkeley Laboratories.

Mr. **Yates**. Should not that work have been done by industry rather than the Government?

Mr. **Tribble**. Oh, no, I think this was a legitimate role. I think that what I am saying here is that there was a need. The building industry was not going to do this work. But we now have done it. And this builds upon the statement earlier that the buildings that we have are not energy inefficient because we did not know how to make them so. We did know how then. We simply have provided the tools in a more useful fashion that can be easily disseminated to the building industry.

Mr. **Yates**. In your opinion, would it serve a useful purpose for the committee to ask contractors with whom you have conservation research contracts to come in and give us their opinion as to whether or not they should continue the research they are now doing in fiscal year 1982?

Mr. **Tribble**. You would have to evaluate that opinion in the light of the fact that the contractors are very unlikely to suggest that the work that they are doing be discontinued.

Mr. **Yates**. I do not think there is any question about that. But do you think it would serve a useful purpose?

Let me put the question in another way, and it bears upon the questions I asked you earlier, as well as what we are talking about now. If we wanted to get information on whether to continue fiscal year 1982 programs that are proposed to be terminated at the end of the fiscal year, where should we go other than to the contractors who are doing that work?

Mr. TRIBBLE. Certainly, they would have information that would be useful to you.

Mr. YATES. Yes.

Mr. TRIBBLE. In addition, we have asked the conservation panel of ERAB to give us their recommendations. This will come to us perhaps too late for this session. Perhaps not. We have asked them to provide recommendations by September.

But we have asked them to consider individual activities, individual projects, that in their judgment are legitimate expenditures for the Government in the area of conservation.

Mr. YATES. Within what financial framework?

Mr. TRIBBLE. Without a framework of financial limitation.

Mr. YATES. Isn't that an unfair charge to give them in view of the fact you are only asking for $17 million for all the research?

Mr. TRIBBLE. They are quite aware of this. We have asked that their recommendations be prioritized. We would certainly want to participate in and also reprioritize, perhaps, those.

So, that we would expect to get from them a list that would cost a great deal more than we are contemplating spending.

Mr. YATES. Would you spell out what ERAB is the acronym for?

Mr. TRIBBLE. Energy Research Advisory Board.

Mr. YATES. Let's come back at 1:15.

## AFTERNOON SESSION

Mr. YATES. Mr. Reporter, show the hearing as coming to order.

Well, here is Mr. Heffelfinger very much alive again. Under your revised guidance from Mr. Heffelfinger, Mr. Stockman, and Mr. Davis, not from Secretary Edwards, doesn't he count at all?

Mr. TRIBBLE. Yes.

Mr. YATES. He does?

Mr. TRIBBLE. Very definitely.

Mr. YATES. But he feels this is not his area, right? He has big issues of policy to worry about.

Under this revised guidance dated April 12, would you be able to provide the committee with information to be developed by the Energy Research Advisory Board, or could that possibly be interpreted under Mr. Davis' memorandum as a plan for the use of appropriations in excess of the President's request? Which would be a fate worse than death.

Mr. TRIBBLE. I will have to get that answer for you.

Mr. YATES. OK. Well, I assume you will have to get that answer for almost everything I ask you for.

What about questions for the record which might result in increased appropriations?

Mr. TRIBBLE. We will have to look at them on an individual basis to see if——

Mr. YATES. I think we ought to call Mr. Davis in here. I am serious. Let's have a hearing with Mr. Davis just to find out why you are doing this. How can you answer any questions, really? Under the directive of Mr. Davis, your answers which you give us in all innocence may be used by us to increase the appropriation. How can you do that?

If indeed you have to go back to Mr. Davis to find out whether you can give us the information from the Energy Research Advisory Board; if you cannot tell us now that you can or cannot get it, I do not know why we should continue this hearing.

Mr. TRIBBLE. Let me say this. That the proceedings of the Energy Advisory Board are public. And certainly the recommendations will be made at a meeting. They would be public information. And I am sure they would be available to you.

Mr. YATES. Then why don't you answer my question now?

Mr. TRIBBLE. I just thought of a good answer.

Mr. YATES. What is that?

Mr. TRIBBLE. That was the one I just gave you.

Mr. YATES. Well, that was a good answer, but could you answer, "Yes?"

Mr. TRIBBLE. Yes.

Mr. YATES. The answer to the question is, yes, that you will make them available?

Mr. TRIBBLE. That is right.

Mr. YATES. All right.

Do you know what I think I am going to do? I think I am going to terminate the hearing right now. I am going to bring Mr. Davis in and find out what you can answer and what you can't answer. You don't know what you can answer and what you can't answer, do you?

Mr. TRIBBLE. I think so.

Mr. YATES. Do you?

Mr. TRIBBLE. Yes.

Mr. YATES. If your answer results in additional appropriations, you are proscribed from answering, aren't you? Suppose one of your answers is taken by us as a basis for an increase in appropriation. You have violated Mr. Davis' order, haven't you?

Mr. TRIBBLE. Certainly not intentionally.

Mr. YATES. Oh, you have to intentionally do it? Does Mr. Davis say intentionally?

Mr. TRIBBLE. No, I don't believe that word is in there.

Mr. YATES. I don't believe that word is in there either. "It will also include inserts and answers to Members' and staff questions to be provided for the record subsequent to a Congressional hearing. All other Congressional requests, formal and informal, for information on the use to which appropriations in excess of the President's request would be put."

Then an exemption to this prohibition is response to questions dealing with what the Department requested from OMB or what was requested in the Department's internal review budget. "These questions may be answered even though the data provided could be interpreted as a plan to increase the President's budget.

"Where appropriate these answers should include a statement of support for the President's budget. The Assistant Secretary for Management and Administration should notify the cognizant appropriation subcommittees of these instructions.

### RESIDENTIAL CONSERVATION SERVICE (RCS)

What was your answer to the question how many States have submitted plans to implement the service?

Ms. **Savitz**. Forty-seven.

Mr. **Yates**. What happened to the other three?

Ms. **Savitz**. They elected not to submit a plan.

### GAO REPORT ON RESIDENTIAL CONSERVATION SERVICE

Mr. **Yates**. Okay.

I take it you are aware of the report dated March 29, 1982, by the General Accounting Office to Senator Weicker on the subject of the Residential Conservation Service, issues affecting the program's future.

Ms. **Savitz**. Yes, we received a copy.

Mr. **Yates**. Have you replied to it?

Ms. **Savitz**. No, we were not asked to reply to the draft. We intend to reply to the final and we are in the process of doing that.

Mr. **Yates**. Is this only a draft?

Ms. **Savitz**. No, that is a final, but we were not asked to respond to the draft.

Mr. **Yates**. I see and you are going to respond to it.

Ms. **Savitz**. We are in the process of responding to that now.

Mr. **Yates**. What is your position? I know that you are in the process of replying to it. But let me ask you a question with regard to one of the conclusions. I read from page 3: "Overall we are concerned about the RCS program's current status. Most of the problems we have found could be substantially resolved by appropriate DOE actions.

"Over the past year, however, DOE has exhibited an unwillingness to carry out the program, expressing its view that the Federal Government no longer needs to require the RCS program." Is that true?

Ms. **Savitz**. We are carrying out the program and have proposed to revise the rules for the program to make it more flexible. We published those for comment last November and the final rules will come out in June.

Meanwhile, States that had approved plans were to be implementing those plans under the existing rules. If States wanted to modify their plans under the proposed rules they could come in for modifications, and we would approve those.

Mr. **Yates**. Why have you modified your rules?

Ms. **Savitz**. In order to give more flexibility to the States and utilities in carrying out the program.

Mr. **Yates**. Why was there a need for additional flexibility? What had you discovered that required the flexibility?

Ms. **Savitz**. It was felt we could reduce the cost to the utilities and felt we could still get good energy savings results, not damaging the program. This would lead toward possible greater acceptance of the audit by the customers and by the utilities, to give them greater creativity.

Utilities have, over the past couple years, become much more aggressive in conservation as they see the benefits to their own financial needs, which was not the case 3 or 4 years ago.

Mr. **Yates**. The Comptroller General says, "We believe this unwillingness to carry out the program has been a major influence on the decisions of 19 States—and particularly 9 States with approved plans—not to implement the RCS program at all."

Your answer to my previous question was that three States had not submitted plans. This indicates that even though plans have been submitted, nine States with approved plans have decided not to implement the RCS program at all.

Are you aware of that?

Ms. **Savitz**. Yes, we are aware that they are waiting until the final revised rules come out.

Mr. **Yates**. Now, why are they waiting? Nine States out of 47 have decided to wait. The rest of them have decided to go ahead?

Ms. **Savitz**. Well, it is 9 out of 40 States, because two of the plans were disapproved and 5 States are devising a plan. So, the rest have gone ahead and have been implementing the program.

Some States, such as Connecticut, have been implementing the program for over a year.

Mr. **Yates**. How valuable is the program?

Mr. **Tribble**. That is a question that hasn't really been answered yet. We don't know how valuable it is because it actually has not been implemented under the final rules. And those that have operated under the interim rules, or the earlier rules, we have accumulated relatively little information.

### EFFECTIVENESS OF RCS

Mr. **Yates**. You draw no conclusions from earlier years? Did you feel it was a good program? What happened last year? When you came in for your appropriation last year, did you say it was a good program?

Ms. **Savitz**. We asked for no funds for it, actually.

Mr. **Yates**. We forced the funds on you, and this is the response.

Ms. **Savitz**. Well, we are implementing the program and——

Mr. **Yates**. Well, what do you think? Why are you implementing it? If you don't think it is good, why are you implementing it?

Mr. **Tribble**. It is mandated.

Mr. **Yates**. That is the only reason?

Mr. **Tribble**. That is right.

Mr. **Yates**. You have no opinions as to whether it is good or not?

Mr. **Tribble**. Philosophically we would question the regulatory burden that it imposes.

Mr. **Yates**. What would be the regulatory burden?

Mr. **Tribble**. Well, it requires utilities to spend money on audits. It thereby raises the rates to the ratepayers. It has some questions of anticompetitiveness. There are a number of——

Mr. **Yates**. What does that mean, anticompetitiveness? I didn't know utilities had to compete.

Mr. **Tribble**. No, no. But under this program, as you may know, the utilities identify companies that are able to do the conservation measures after the audits have been completed. Those companies are listed. The question has been raised as to whether or not the mere listing of companies by a utility, gives them the advantage over others that may not be listed.

**Mr. Yates.** What is the attitude of the utilities toward the program?

**Mr. Tribble.** I think you would have to say it is mixed. A lot of them find it repulsive. On the other hand, others are doing this kind of thing on their own initiative.

So, it goes the full gamut.

**Mr. Yates.** Has the Association of Utilities and Railroad Commissions taken any position on the program?

**Mr. Tribble.** Not that I am aware of.

**Ms. Savitz.** I do not know of any resolution.

**Mr. Yates.** Have they expressed themselves in any way?

**Ms. Savitz.** They have testified, commented on the proposed rules. Also, the Electric Edison Institute and American Gas Association.

**Mr. Yates.** Have they indicated by their testimony that they favor the program?

**Ms. Savitz.** I would have to check it. I know they gave specific comments on it. Now, I think last year they were the ones who were supporting repeal of the legislation.

**Mr. Yates.** They favored repeal of the legislation last year?

**Ms. Savitz.** Yes.

**Mr. Yates.** What form did that request for repeal take—letters to the Congress?

**Ms. Savitz.** I think there may have been letters to the Congress. There was, on the Senate floor, last year, an actual amendment to repeal the legislation.

**Mr. Yates.** Oh, there was on the House floor, too. Mr. Loeffler offered that amendment in committee, and it carried. So, the bill went over to the Senate and they put it back in, I think.

**Ms. Savitz.** Right.

**Mr. Yates.** Yes, by a vote of 85 to 7.

**Ms. Savitz.** Right.

**Mr. Yates.** So, at least the Senate thought it was a good idea.

**Ms. Savitz.** Yes.

### UTILITY CONSERVATION PROGRAMS

**Mr. Yates.** Suppose RCS is done away with, how many utilities would develop their own conservation programs of this kind? Do you have any knowledge of that?

**Mr. Tribble.** We do not have any way of answering that. But of course, you know that the utilities are doing a good bit on their own. Here is one by a gas light company promoting the sale of energy efficient gas appliances. And I am sure you are familiar with the flyers that come in your utility bills, both electric and gas, that are encouraging conservation.

**Mr. Yates.** Yes.

**Mr. Tribble.** So, that it is really impossible to say how many would go forward with it. It all depends on the circumstance of the utility. If they have adequate capacity and are not going to have to build a plant, then conservation has a different effect on their business than if, to meet future load growth, they are going to have to build expensive facilities.

So, I think that they would have to look at it in the light of their own circumstances.

### APPLIANCE STANDARDS

Mr. YATES. Do you have any opinion as to whether or not the appliance industry favors the continuation of a standards program?

Mr. TRIBBLE. Here again, they are divided.

Mr. YATES. They are divided. If there are no national standards, do you have any opinion as to whether the States will enact standards of their own?

Mr. TRIBBLE. Some States now do have standards. The rules will provide that there can be waivers to permit additional States to have their standards.

Mr. YATES. Will your rescission of your own rules affect the States? Will they be allowed to issue their own rules, even though the Federal Government does not have such rules?

Mr. TRIBBLE. It is my understanding that they will be able to come in with requests for waivers. And, depending on the outcome of that request, then will be able to have their own standards.

Mr. YATES. How much money is in your budget to update test procedures and to develop new procedures as required?

Ms. SAVITZ. None.

Mr. TRIBBLE. Not any.

Mr. YATES. None. How much was in there for fiscal year 1982?

Ms. SAVITZ. We had $1,000,000 for the labeling, updating test procedures, and $632,000 for standards development.

Mr. YATES. Have you spent all of that?

Ms. SAVITZ. It will be spent.

Mr. YATES. There is no request for 1983?

Ms. SAVITZ. Correct.

### LABELING PROGRAM

Mr. YATES. I thought you said you were continuing the labeling program?

Ms. SAVITZ. We continue to support the labeling program.

Mr. YATES. Without money?

Ms. SAVITZ. Yes.

Mr. YATES. How are you going to support it without money?

Mr. TRIBBLE. As new developments come on the market that would require additional test procedures, we would not have the money to develop it.

Mr. YATES. Should you have the money to develop them?

Mr. TRIBBLE. We are taking the position that we should not.

Mr. YATES. Is that because of what Mr. Davis said?

Mr. TRIBBLE. No. No.

Mr. YATES. This is your own, genuine, dispassionate, objective opinion?

Mr. TRIBBLE. Are there not other ways that this can be done?

Ms. SAVITZ. Well, there are industry groups that could form to do test procedures.

Mr. YATES. What do you mean when you tell the Appropriations Committee that you are supporting the labeling program? You are doing it in theory only, right? Would you like to reply, Dr. Savitz? I see you looking to the boss.

Ms. **Savitz**. I mean we are not supporting repeal of the provisions for the labeling program. Whereas we would support repeal of provisions for the standards program.

Mr. **Yates**. Well, I thought I understood you before to say you support the labeling program.

Ms. **Savitz**. Yes, we support continuing it.

Mr. **Yates**. Without money though. Do you think money would be helpful?

Mr. **Tribble**. Do you not think that a manufacturer that has an interest in having an energy efficient appliance on the market would be willing to come in and pay the cost of having such a device tested? We think that there is a possibility this will be. We think it is a good idea. We do not think it was a good idea for us to put Federal money into it.

Mr. **Yates**. Okay, who is going to test it? Are you going to test it?

Ms. **Savitz**. We do the test procedures, and——

Mr. **Yates**. How do you do it without money?

Ms. **Savitz**. Take an existing test procedure or a test procedure that an industry group would put together, and adopt and use that.

Mr. **Yates**. They don't need you for that, do they?

Ms. **Savitz**. The company self-certifies——

Mr. **Yates**. They don't need you for that do they?

Ms. **Savitz**. They wouldn't then need us. The Federal Trade Commission issues the rules as to which products——

Mr. **Yates**. So, you would be totally out of the picture?

Ms. **Savitz**. If we didn't get involved with the test procedure. Our responsibility is administration of the test procedure, and the Federal Trade Commission does the monitoring and implementation of the labeling.

Mr. **Yates**. What would your response be if somebody wrote you a letter asking, "What do you think of the labeling program?"

Mr. **Tribble**. What do we think of the labeling program?

Mr. **Yates**. Yes.

Mr. **Tribble**. We think it provides the consumer with worthwhile information.

Mr. **Yates**. How do you know if the labeling program will be continued?

Mr. **Tribble**. We have no assurance that it would. However we have the expectation that it would.

Mr. **Yates**. Then Secretary Edwards' wife may not find a label on her refrigerator if she goes out to buy another one?

Mr. **Tribble**. We think it is in the interest of the manufacturers to have——

Mr. **Yates**. I agree. But, you know, you may think the manufacturers should do a lot of things the manufacturers don't think they ought to do. Suppose, in a period of recession, they decide they can save money by not labeling their products. Why not save the money during this time of trial?

Mr. **Tribble**. Because it may very well cost them more sales than it would otherwise.

Mr. **Yates**. That is a possibility. That is right. They would have to do what the contractor does, decide whether or not it is more advantageous to buy a nonefficient refrigerator, boiler or oil burner, or to buy an efficient one.

So, the Government provides no information for consumers then. The Government leaves it up to the manufacturer to decide how much he will let be known to his consumers, doesn't it? Is there no role for the Government in telling the people of the country that a product is good or isn't good?

Mr. **Tribble**. If we want to get into that——

Mr. **Yates**. You are into it now aren't you?

Mr. **Tribble**. —we could carry it to ridiculous extremes.

Mr. **Yates**. Are you doing that now?

Mr. **Tribble**. We are trying to get out of it.

Mr. **Yates**. Does that mean you have been carrying it to ridiculous extremes?

Mr. **Tribble**. No.

Mr. **Yates**. Then why use that as an example? The question I am asking is whether it is useful for the Government to continue to advise the people of the country as to how they might spend their money wisely, rather than leaving that decision for a manufacturer.

Mr. **Tribble**. We think that there are other organizations that do, in fact, evaluate these things; that do make a business of providing this information.

Mr. **Yates**. Like Consumers Union?

Mr. **Tribble**. Yes, that is one of them.

Mr. **Yates**. They are going out of business, some of their activities are going out of business. Didn't you read in the paper that they are stifled for money, too?

Ms. **Savitz**. Yes.

Mr. **Yates**. Consumers Union is in financial trouble, so, they are out of the business. The Government is in financial trouble; they too are getting out of the business. Everybody is going out of the consumer protection business, and the poor consumer has to listen to the manufacturer. And the manufacturer still lives by that old Latin admonition, "caveat emptor", let the buyer beware. Right?

Mr. **Tribble**. Not necessarily.

Mr. **Yates**. Not necessarily. Okay.

Mr. **Tribble**. There are too many cases where the manufacturers have had adverse circumstances inflicted upon them by the adoption of that kind of policy.

Mr. **Yates**. Would you repeat that? I didn't follow you.

Mr. **Tribble**. They have had to be a little bit more responsive and responsible in the sale of their products because of cases that have been brought against them for adverse impacts.

Mr. **Yates**. Suppose we hadn't had the Government regulations, do you think General Motors, Ford and all the other car companies would have called back 600,000 or a million vehicles for corrections? I do not think they would have. They didn't do it before there was such an organization.

Mr. **Tribble**. That is true.

Mr. **Yates**. Poor Mrs. Edwards. Good thing she bought her refrigerator when she did.

Mr. TRIBBLE. You know we could develop this into an opportunity for a consulting engineering firm.

Mr. YATES. To do what?

Mr. TRIBBLE. To evaluate these appliances and——

Mr. YATES. Are you going to give them a consulting contract?

Mr. TRIBBLE. And have an appliance——

Mr. YATES. Are you going to give them a consulting contract to see whether they would do it?

Mr. TRIBBLE. No, we wouldn't.

Mr. YATES. Okay.

### URBAN WASTE

Mr. YATES. How viable an industry is the urban waste industry. You have $4.8 million for urban waste projects. That is kind of interesting. Are you aware of the Manchester discovery?

Mr. TRIBBLE. I am aware of the publication of information relative to it.

Mr. YATES. Hasn't that piqued your interest?

Mr. TRIBBLE. Yes.

Mr. YATES. That is good. Okay. Even though it may result in an increased appropriation for this project?

Mr. TRIBBLE. I doubt that such an appropriation would be based on such an unproven piece of information.

Mr. YATES. Should it be though? I listened to a discussion of it on the air. And I felt moved to get in touch with the British Embassy to get all the additional information we could about it. We were able to get a report from the professor who is in charge of it. He says it is a marvelous project, as you might expect. I would think it would be, if there is anything to his idea.

You are going to tell me leave Government out of it, let industry move in. But, industry is not going to move in on a test basis at $30 million or $40 million for a demonstration plant, is it? Isn't this something the Government should move into?

Mr. TRIBBLE. No.

Mr. YATES. Okay. Tell me why Government shouldn't move into it. We are going to be drowned with all our garbage; an urban waste program that can turn garbage into oil, my goodness, that is almost as great as solar energy, isn't it?

Mr. TRIBBLE. Well, that gets us into quite a bit of a discussion. There are such things as gasifiers for biomass and liquefaction installations for biomass.

Mr. YATES. Right.

Mr. TRIBBLE. None of them is as efficient as direct combustion. Now, we have the proposal that we take our urban waste and make oil out of it.

Mr. YATES. Yes.

Mr. TRIBBLE. But it would appear to me that if you are going to have to do all of the steps that are required or mentioned in this document, that after you get it classified and——

Mr. YATES. You mean you have looked into this?

Mr. TRIBBLE. You didn't get one of these?

Mr. YATES. No, we didn't get it from you. All right. Let's see what you are talking about.

Mr. **Tribble**. They say that you have to shred it, air classify it and do several other processes, and then run it through their chemical process in order to make oil. It would appear to me that it would be more energy efficient after the classification and the combustibles have been separated, simply to burn it rather than to make oil of it.

Mr. **Yates**. Well, this memorandum you have handed us would indicated that there is nothing new in this process. Whoever prepared this in your shop says a similar American system was developed 10 years ago. A pilot plant was constructed at Albany, Oregon, to operate at 353 degrees centigrade, 3,000 PSI with hydrogen and alkaline catalyst.

It demonstrated the technique to produce liquid fuel, but the price of oil would have to be tripled with all the costs. In the past on at least two occasions, scale-ups of municipal waste energy pyrolysis process and bench scale tests have been attempted in the U.S. Both failed.

All right, but here is a memorandum from our files entitled "Garbage to Oil." In a conversation with the co-inventor of the Manchester, England oil process, he said he has tested a reactor vessel which he describes as part of a small pilot plant. Within a few weeks he expects to have it advanced to the point where he can process a ton of garbage a day from which he expects to get two or three barrels of oil. The feedstock can either be garbage or a variety of biomass is ground up and fed into the reactor along with a two-part catalyst, part metal and the catalyst may be recycled.

Dr. McCauley said the Badger Chemical and Engineering Company in Massachusetts at his request has sent representatives to look at the bench-scale process. We will call Badger and find out what he thinks of it. We'll tell them that DOE says Americans have tried it before and see what he says.

So, at any rate, we have to go back to garbage instead of oil, don't we?

Mr. **Tribble**. If what you just read is true, then the garbage would have to have the BTU equivalent of wood waste. It is highly unlikely that waste, as an overall municipal waste, would have that kind of a BTU value. That classification process obviously doesn't remove bricks and other things that might be found in it. So, it has a long way to go. But even if it were to be the case, you are talking about a ton of garbage giving you the equivalent of three barrels of oil, that is the equivalent of 18 to 19 million BTU's which would get back to about 9,000 BTU's per pound which is about the same as wood. A little bit higher than wood.

## DISTRICT HEATING

Mr. **Yates**. Are you doing anything in this fiscal year, 1982, in district heating or integrated community engineering systems?

Mr. **Tribble**. No, the district heating—to answer your question, no. The district heating process is something that has been with us for many, many years. It is not anything new. It can be implemented whenever it is economical.

### COGENERATION

Mr. **Yates**. What about cogeneration?

Mr. **Tribble**. Cogeneration is another very good use of energy. It has been with us for, again, these very many years, and is particularly adaptable to certain processes where there is need for electric power and end process heat.

So, it is a real good idea. It is not something we should be putting money into.

### INDUSTRIAL PROGRAMS

Mr. **Yates**. Let's talk about industrial programs, there is no money for industrial programs in your new budget, right?

Mr. **Tribble**. Right.

Mr. **Yates**. I have the impression there are a number of them that are good. There were laundries and other things, weren't there, Maxine?

Ms. **Savitz**. Work with recuperators.

Mr. **Yates**. Yes. All those are brought to an end now?

Ms. **Savitz**. Many have been completed.

Mr. **Yates**. There are no others that deserve financing?

Ms. **Savitz**. It is to that effect.

Mr. **Yates**. The answer is yes?

Ms. **Savitz**. Yes.

Mr. **Yates**. There are no others. In other words, you are leaving that to industry now?

Ms. **Savitz**. Yes.

### ENERGY RESEARCH ADVISORY BOARD

Mr. **Yates**. No tests. How valuable is the work of the Energy Research Advisory Board?

Mr. **Tribble**. We think it is valuable, very much so. We will look forward to their recommendations from this new panel that has been created.

### ERAB RECOMMENDATIONS FOR INDUSTRIAL CONSERVATION

Mr. **Yates**. In their report of November 1981, on the subject of industrial conservation at page 32 they say: "Industrial conservation ranked in the high category when compared with all other DOE R&D programs. ERAB recommends this program be restored close to the fiscal year 1981 funding levels." That is pretty substantial, isn't it?

Thus, ERAB recommends an increase in the proposed budget by approximately $70 million.

"ERAB expressed concern that, although all industries have incentives to conserve energy, many of them lack the ability to conduct R&D either because of their fragmented industrial structure or because of historic failure to support research. This appears to be true of many small and medium sized businesses, that in the aggregate, consume large amounts of energy. Short-term, high-payoff R&D will not be conducted unless Federal leadership is given."

I take it you would agree with that.

Mr. TRIBBLE. Their recommendations, as you just read, were quite general. They said generally we should spend more money. Now what we have done is asked them to give us some specific suggestions whereby we could really evaluate individual projects.

Mr. YATES. Well, suppose they give you that evaluation and recommend that you have as much money for 1983 as you had in the 1981 budget. What would you do then without any money to implement their recommendations?

Mr. TRIBBLE. They will be coming in with this, hopefully around the middle of September, in time for us to give consideration to this for the next year's budget.

Mr. YATES. In the Commerce Business Daily there is a publication of a notice of program interest—membrane separation processes. The Department of Energy industrial energy conservation program is an important part of the national energy plan to achieve energy self-sufficiency.

One objective of the program is the increase of energy use through R&D activity. The major thrust of the program is to do research.

What you are trying to get is a membrane separation process. Mr. Stockman struck that money from the Office of Water Research Technology. Why are you asking for it? Why don't you identify yourself to the reporter and speak up for the committee.

Mr. STREB. My name is Alan Streb, the Director of the Office of Industrial Programs. This particular effort——

Mr. YATES. The Office of Industrial Programs is non-existent, isn't it?

Mr. STREB. It will be.

Mr. YATES. Go ahead.

Mr. STREB. This product is oriented toward concentration of food products, for example, tomato juices and things of this sort. It is oriented towards a more efficient process for concentration of such food products, as opposed to the conventional evaporation process.

It has nothing to do with water except for the removal of water from such products.

Mr. YATES. Why do you use a membrane separating process?

Mr. STREB. Membrane freeze separation and concentration techniques can be shown to be more efficient than conventional evaporation. The purpose of this program is to develop systems which would enable the elimination of part of the evaporation processes.

Mr. YATES. Why do you do that at all? Why are you having this form of research? Why can't industry do it?

Mr. STREB. Industry in this area is very diffuse. The food processing industry is very diffused, and has in the past, at least, exhibited relatively little ability to develop new techniques for their own process needs. The purpose of this——

Mr. YATES. Is this the only industry that could be so described?

Mr. STREB. I believe that there are other industries such as textiles that might fall into the same general category.

Mr. YATES. Well, are you having programs for the textile industry?

Mr. STREB. This work is applicable to textiles as well as to food processing, although the primary orientation of this particular effort is for food processing.

Mr. **Yates**. If the industry itself isn't willing to undertake the kind of research to make the energy savings that would come from increased research and development, for most industries it would be too bad, would it not, because $17 million won't go very far, will it?

Mr. **Streb**. $17 million next year includes a very small amount for the industrial process work. Nothing for the hyperfiltration work. This is 1982 program money that is being addressed in the Commerce Business Daily notice that you have mentioned. We anticipate that the research work that we fund under that will carry that technology to the point where industry can pick up and implement it on its own.

Mr. **Yates**. What is the $17 million going to be used for?

Mr. **Streb**. The $17 million includes many generic technologies. Dr. Savitz could get into the broad aspects of that. Only part of the $17 million is oriented toward industry, and that part is aimed at the continuation of work on advanced heat pumps. About $1 million of the $17 million is oriented towards——

Mr. **Yates**. Are you saying the only amount available for the industrial processes in your 1983 justification is a $1 million for heat pumps?

Mr. **Streb**. $998,000, as a matter of fact.

Mr. **Yates**. What happens to the food industry? Suppose they aren't through with this work by that time?

Mr. **Streb**. As far as our plans are concerned, we will carry the research through to a point where we have demonstrated the acceptability of the technology, and the industry is going to have to find a way to carry it forward on their own.

Mr. **Yates**. Will you be able to do that in 1982?

Mr. **Streb**. In terms of actual completion of work in 1982, we don't expect to be able to. In fact, we would not expect that the actual contract work would get underway until toward the end of 1982. We have made provisions, however, for continuity of program management through one of the national laboratories to manage the contract work, which would be expected to run for about another year.

Mr. **Yates**. Which laboratory?

Mr. **Streb**. This would be out of Idaho.

Mr. **Yates**. Which one?

Mr. **Streb**. I believe that article——

Mr. **Yates**. Which laboratory was that?

Mr. **Streb**. Idaho National Engineering Laboratory.

Mr. **Yates**. Is that a Federal lab?

Mr. **Streb**. Yes.

Mr. **Yates**. Being operated with Federal funds?

Mr. **Streb**. Yes.

Mr. **Yates**. What you are doing then is moving the funding from your shop over to theirs?

Mr. **Streb**. The engineering laboratory itself is run by Government contract employees. There are funds being taken from the 1982 budget and applied to the laboratory to provide for this management continuity capability.

Mr. **Yates**. Thank you.

## INNOVATIONS IN STEEL INDUSTRY

We had testimony earlier this year that of 15 major innovations introduced in the steel industry over the last 30 years, only two were developed in this country and both were DOE cost-shared. If this is true, how is it possible to get industry involved; the history is so contrary? That is their worry.

Mr. TRIBBLE. I think that might have something to do with the fact that a lot of the steel is imported because the processes used in other countries are in fact more efficient.

Mr. YATES. The answer to what you are suggesting, is to support the steel industry's contention that we ought to impose tariffs to restrict the import of steel.

Mr. TRIBBLE. No. I am suggesting that perhaps they should do more research.

Mr. YATES. Okay. But they haven't done it; the records show that?

Mr. TRIBBLE. Well, that is their problem.

Mr. YATES. All right.

## ELECTRIC VEHICLES

How far advanced is the electric car industry? In your statement you indicated that you are looking for a battery. We have been looking for that battery for many, many years. Are we no closer to realizing it?

Mr. TRIBBLE. Yes, we are. There has been substantial progress in batteries in recent years. And much of it through the efforts of DOE. The development of the electrical vehicle has moved forward to the point where we have determined that the most significant development that we could get next would be a battery that would give us more miles, better performance at less cost.

So, we are, in fact, suggesting that we spend some money on further development of batteries. But we don't think that there is really any need to go forward with further development——

Mr. YATES. Are you going to spend money on batteries?

Mr. TRIBBLE. We have this amount, some $7 million I believe in there for electrochemical work.

Mr. YATES. Is that a plastic battery?

Mr. TRIBBLE. No.

Mr. YATES. None of the research is for plastic batteries?

Ms. SAVITZ. We are looking, in the lead acid battery, for potential corrosion-resistant plastics for battery components. Otherwise it is looking at sodium sulfur, aluminum air, lead acid.

Mr. YATES. The Technology page from the April 1982 Science Digest says this, "A revolution in battery technology may make possible the long-awaited arrival of inexpensive electric cars.

Research at the University of Pennsylvania and C&D Batteries, of Plymouth, Pennsylvania, meeting recently unveiled a new breed of power cell made from conducting organic polymers, also called 'plastic metals.' These new cells may be able to supply 10 times the power of conventional batteries while being virtually maintenance-free during their long life. They have also been shown, experimentally, to be chargeable up to 1,000 times."

Are you supporting this program?

Mr. **Tribble**. No, we are not.

Mr. **Yates**. Sounds fascinating, doesn't it?

Mr. **Tribble**. It does.

### AUTOMOTIVE TURBINES

Mr. **Yates**. What is the status of the two turbine programs? You are going to terminate them?

Mr. **Tribble**. Both of them have and will, with 1982 funds, move forward to the point where there will be dynamometer tests. Beyond this point, improvements will be matters of substitution of ceramic parts for the metal parts. We do, therefore, propose to go forward with research on ceramic components.

Mr. **Yates**. Can you do that separate from the engine program itself?

Mr. **Tribble**. Yes.

Mr. **Yates**. Who is going to pay for the ceramic research, are you, or are the companies, or will it be cost shared?

Mr. **Tribble**. Is that cost shared? The engine work has been cost shared, but the ceramic work will fall upon us. We would hope that if we come forth with substantial developments in the ceramic parts, that the industry would cost share to the extent of putting them in the engine and giving them a try.

Mr. **Yates**. The handwriting is on the wall. The companies see that the Government is cutting back and cutting back. What are the prospects of the industry being aggressive when it sees all the drastic reductions in Government support? Are they going forward with the research, or are they going to terminate it at the same time the Government does?

Mr. **Tribble**. I don't believe we have an answer for that. We do know that they have a continuing interest in the development of the gas turbine for transportation use. Whether or not it would be in an automobile configuration, or, more likely, in a truck configuration, is their decision. We would expect them to put this in trucks first. But we would also expect them to use ceramic components we would develop, because this is the only way substantial increases in efficiency can be accomplished.

Mr. **Yates**. Does it make sense for you to get in touch with the University of Pennsylvania on the plastic battery?

Mr. **Tribble**. I think so.

Mr. **Yates**. Yes. Isn't it possible you may want to put some money in there?

Mr. **Tribble**. Yes.

Mr. **Yates**. Do you have enough money in your new budget to do it?

Mr. **Tribble**. We could probably scrounge around and find some because you see we have this $7 million. It appears that this was a better place to put it. Maxine tells me we have had preliminary discussions with them already.

Mr. **Yates**. How long have they been working on this?

Mr. **Tribble**. I do not know. I heard one result of a polyacetylene work that they were doing at least a year ago. What do we know about that? How long have they been doing this work?

Mr. **Brogan**. John Brogan, Director of the Office of Energy Systems Research, the fundamental research arm of the Conservation Program. We did put money into the fundamental research which started at the University of Pennsylvania some 4 years ago.

Mr. **Yates**. Is that what this comes out of?

Mr. **Brogan**. Yes, it derives directly from this work. And this work was picked up by, I believe, did you say Allied Chemical?

Mr. **Yates**. No, I said Plymouth, researchers at the University of Pennsylvania and C&D Batteries of Plymouth. It does not say Allied Chemical.

Mr. **Brogan**. C&D is a division of Allied and has, in recent years, been putting some money into it. I am not sure what the mix is now. Our staff did look at that battery and their recent advances in it. We concluded that private industry was funding it adequately, and they really couldn't get much of an acceleration from our putting additional funds into it.

Mr. **Yates**. Really?

Mr. **Brogan**. Yes.

Mr. **Yates**. When did you last contact them, Mr. Brogan?

Mr. **Brogan**. Oh, there was a press release related to the article you spoke of, oh, in the last November time frame.

Mr. **Yates**. About 6 months ago?

Mr. **Brogan**. Yes, so we are well aware of what has been going on regarding this battery. But I did want to point out that the start of it was the fundamental research that was funded out of the storage program.

### FOREIGN WORK ON AUTOMOBILE ENGINES

Mr. **Yates**. What kind of automobile engines are foreign competitors working on? I guess you better put that in the record, hadn't you? Are American manufacturers' foreign competitors working on engines of their own? They must be.

Mr. **Tribble**. Yes, I am sure they are, all kinds.

Mr. **Yates**. Yes. Chrysler is using the Volkswagen engine in the Horizon, isn't it?

Mr. **Stadler**. I am Henry Stadler, Director of the Office of Vehicle and Engine Research and Development.

Was the question whether American manufacturers——

Mr. **Yates**. What are foreign competitors doing in the field of automotive engines? Are they ahead of us, behind us, or do we not know?

Mr. **Stadler**. I think that it is sort of mixed. There are areas in which they are clearly ahead of us, and I think some other areas in which we are probably ahead of them.

Mr. **Yates**. Really? Which ones are those?

Mr. **Stadler**. Well, this is——

Mr. **Yates**. I had the impression that they are way ahead of us on most automobile matters. Am I wrong? The public doesn't think I am wrong. They are buying mostly foreign cars, aren't they?

Mr. **Stadler**. Well, I think there certainly has been an increase in the number of foreign cars bought and a public feeling of the sort you are speaking of. The——

Mr. **Yates**. Yes, I will give you an example immediately. I just went south and rented a car. As I always do, I rented an American car, drove away, blithly tried to roll the window down, and found I couldn't do it. The window was stuck. Then the door handle fell off and a few other things took place. I brought it back to the company and they said this is commonplace. I said, "Does this happen with foreign made cars, too?" They said, "No, it doesn't." Now, that is almost a libelous statement. If I had been with a domestic manufacturing company I would have been outraged by that kind of statement but I went to another place to rent a car and they told me the same thing.

Why is it in their interest to rent foreign cars rather than American cars? I would assume they get a higher rental for the American cars because they are generally larger than the foreign cars. And I think it is terribly unfortunate. I do not think I am different than a great many people in this country who are beginning to think that they can get a better car if they buy foreign.

I have several cars and they are American. But I have little pieces of trouble with them which you and the automobile industry would probably call quality control, right?

Mr. **Stadler**. Well, probably.

Mr. **Yates**. Yes. But we are talking about engines now. You say they are ahead in some respects, and we are ahead in others. We are terminating our research on the two turbines and on the Stirling. Are we doing this at a time when to do so would jeopardize further the very precarious positions of our automobile companies? That is a big question, isn't it?

Mr. **Stadler**. Yes.

Mr. **Yates**. What is your impression?

Mr. **Stadler**. Well, I think that among the engines which we are ahead on are primarily the two that you have mentioned and the Adiabatic Diesel, at the Cummins Engine Company which you heard from——

Mr. **Yates**. But they said they wouldn't be able to bring that in for 4 or 5 years.

Mr. **Stadler**. Those are all Government-supported projects.

Mr. **Yates**. Has the Cummins project been terminated too?

Mr. **Stadler**. We have a small amount of support for that project, but there is more support for it by the Army Tank Command. Now, even if both of these Government agencies stopped support, I think it is possible Cummins would continue. I am not sure.

Mr. **Yates**. How far away are they from completing research on it? Or are they in the development stage?

Mr. **Stadler**. There are varying estimates of how long it would take to put it on the road. But I suppose 5 or 10 years might be a reasonable guess.

Mr. **Yates**. You talked about 1988 last year.

Mr. **Stadler**. Yes, I know. Mr. Kamo is in the short time end of my range and some other people are on the other end.

### TURBINE ENGINES

Mr. **Yates**. What about the turbines? Should we be stopping research on those?

Mr. **Stadler**. We would like very much to have the industry continue the support of that and let the Government discontinue its support.

Mr. **Yates**. In view of the fact that you must have told them that the Government was going to terminate their support, has industry indicated it will continue to do research?

Mr. **Stadler**. I think they have been pretty unanimous in saying that they don't think they will be able to continue it.

Mr. **Yates**. What happens to the research? It goes down the drain?

Mr. **Stadler**. Well, they might change their minds if we stopped our support. I am not quite sure that this is really something of policy that I think is——

Mr. **Yates**. Suppose they don't change their minds? Will our industries be hurt by the stopping of the research?

Mr. **Stadler**. Yes.

Mr. **Yates**. How important are the automobile industries to our country and the economy? That is the question that the companies will have to decide for themselves, isn't it, now that the Government has terminated research.

Mr. **Stadler**. I think that is our policy as I understand it.

Mr. **Tribble**. Aren't they in a better position to make that determination than the Government?

Mr. **Yates**. I guess, because as Mr. Stadler says, they are terminating, apparently research doesn't mean very much. He thinks it does. Apparently they don't, because they say they are not going to continue it.

Mr. **Stadler**. May I clarify my position on that slightly?

Mr. **Yates**. Perhaps I misinterpreted. I don't want to put words into your mouth, but that was my impression from what you said.

Mr. **Stadler**. Well, I guess I feel that the industry is in great financial difficulty. It has rather slim resources, and within the disposition of those resources, it would find it necessary to discontinue this.

### AUTOMOBILE ECONOMY

Mr. **Yates**. Is it in the national interest that an automobile engine be developed that is capable of providing something like 42.5 miles per gallon?

Mr. **Tribble**. I think we have those now, do we not? Don't we have some automotive manufacturers that are advertising——

Mr. **Yates**. Ask our friend Mr. Stadler.

Mr. **Tribble**. I am sure we do.

Mr. **Yates**. Mr. Stadler.

Mr. **Stadler**. The objective of one of these programs is to have 42.5 miles per gallon in a 3,100 pound car. We do not now have 3,100 pound cars getting 42.5 miles per gallon.

Mr. **Yates**. What weight are they?

Mr. **Stadler**. Well, the ones that get 42.5 miles per gallon are mostly about 1,800 pounds or 2,000 pounds. Significantly smaller.

Mr. **Yates**. Something like a Fiesta?

Mr. **Stadler**. Yes, I can tell you are an American automobile buyer. You didn't say Rabbit.

Mr. **Yates**. In other words, if we want 42.5 miles per gallon, we have to drive a 1,800-pound car.

Mr. **Stadler**. At present.

Mr. **Yates**. How do those cars stand up in the crash tests? Do they collapse?

Mr. **Stadler**. Well——

Ms. **Savitz**. He drives a Fiesta.

Mr. **Yates**. Really? What was Fiesta's rating in those tests?

Mr. **Stadler**. I believe that in the accident records that Fiesta is not as bad as some of the other American cars.

## STATUS OF TURBINE AND STIRLING PROGRAMS

Mr. **Yates**. What stage of development will the turbines and Stirling engine be in when you pull the curtain down?

Mr. **Tribble**. The turbines will be in the state where there is a complete metal engine that has been subjected to dynamometer tests. We feel that that is an appropriate milestone, because beyond that point, the further development will be the substitution of ceramic parts for the metal parts so that we can go to the higher temperatures that would be required to get the high efficiencies. And we would propose to go ahead with the research on the ceramics.

We have, in the program, made good progress in the ceramics work in recent years.

Mr. **Yates**. Are there no metals that can be used for the higher temperatures?

Mr. **Tribble**. That is right.

Mr. **Yates**. What do they do in military vehicles? I guess cost is a factor.

Mr. **Tribble**. Military vehicles are governed by the same limits we are because of metal temperature limitations.

Mr. **Yates**. Don't they use some exotic metals that are so expensive you couldn't use them?

Mr. **Tribble**. Of course you can go into the exotic metals. Chromalloy, stainless steels, and others, will take more temperature, but on the other hand you are getting into a very expensive installation.

Mr. **Yates**. Did you want to say something?

Mr. **Stadler**. Well, in larger turbines General Motors, at least, uses fins with the air coming through the fin which cools the fin and allows the turbine to go to a higher temperature even using metal parts. You cannot do that in a small turbine because there is not enough room inside the blade.

Mr. **Yates**. You are advertising a Cadillac now?

Mr. **Stadler**. No.

Mr. **Yates**. Or a Lincoln?

Mr. **Tribble**. No. He is saying that that technology can't be applied to an automotive size gas turbine, isn't that right?

Mr. **Stadler**. Yes.

Mr. **Yates**. Really? Not even big cars have that?

Mr. **Stadler**. No.

Mr. **Yates**. I see. That is for tanks?

Mr. **Stadler**. Yes. These very large——

### BATTERY DEVELOPMENT

**Mr. Yates.** What portion of your multisector request is related to battery development, is that $7 million?

**Mr. Tribble.** That is right.

**Mr. Yates.** How much money was in your budget for fiscal year 1982 for that purpose?

**Ms. Savitz.** $8 million out of the transportation program, and $25 million out of the energy storage program.

### HYBRID VEHICLES

**Mr. Yates.** Is there any interest in hybrid vehicles?

There was some talk about electric and gas, I guess.

**Mr. Tribble.** It is an interesting innovation. It is something we would not want to go ahead with further funding on.

**Mr. Yates.** Has any infrastructure been created for electric vehicles as a result of the purchase program?

**Mr. Tribble.** I would say very little.

**Mr. Yates.** They are waiting for that battery too, aren't they?

**Mr. Tribble.** Well, on the other hand, this kind of thing is much more adaptable to a fleet operation. Where you can have centralized maintenance and centralized recharging facilities and things of that nature, then there is an opportunity to take over. But certainly it is not a structure that would support an on the road vehicle at this time in general use.

### STATE AND LOCAL GRANTS

**Mr. Yates.** You are terminating the State and local grants, aren't you? What about the States' ability to encourage conservation and other energy matters? Are you going to let them have it under block grants if they want to do it?

**Mr. Tribble.** Yes.

**Mr. Yates.** Is that the purpose? Have the States indicated they are willing to undertake the amount of funding for this activity?

**Mr. Tribble.** Some have, and others haven't. There have been a number of—a full range of from yes to no of the answers when we have asked if the Federal support for those programs was withdrawn, would they continue.

**Mr. Yates.** Suppose it were a cost-shared program? Do you think more States would join?

**Mr. Tribble.** Isn't it cost shared now?

**Dr. Chiogioji.** No.

**Mr. Yates.** Do you think it ought to be a cost-shared program?

**Mr. Tribble.** No.

**Mr. Yates.** You don't?

**Mr. Tribble.** We think we should get out of it. And if they think it is important enough to go forward with, they should.

**Mr. Yates.** How long will existing funds carry the programs in the States?

**Dr. Chiogioji.** It varies by program. The schools and hospitals programs will probably go another year because our grants probably won't go out until September. Weatherization will probably run out by December of this year. The State energy conservation program grants will probably run out in about a year from now.

Mr. YATES. Suppose the program were continued in fiscal year 1983, can you tell us what an optimum level of funding would be to provide State administrative costs and program services, or is that something Mr. Davis won't let you do?

Dr. CHIOGIOJI. Yes.

Mr. YATES. Would you be in a position to provide that information?

Mr. TRIBBLE. No, we wouldn't.

Mr. YATES. There is a lot of congressional interest in this.

Mr. TRIBBLE. No, I would have to suggest that that come from the States themselves.

Mr. YATES. Okay.

### SCHOOLS AND HOSPITALS

Do you have a backlog of projects for which funding has not yet been provided?

Dr. CHIOGIOJI. It depends on what program you are talking about. Are you talking about schools and hospitals?

Mr. YATES. Yes.

Dr. CHIOGIOJI. Typically we are getting about three times more project applications than we have funds for. In the case of weatherization, as you know, we have only done about between 800,000 or 900,000 homes. According to present rules and regulations, there is a backlog of maybe 12 million homes.

So, you know, it is really a policy call as to whether——

Mr. YATES. How many more could you do if the Congress provided another $50 million in 1983?

Dr. CHIOGIOJI. For which program?

Mr. YATES. Schools and hospitals.

Dr. CHIOGIOJI. It is really hard to say because each of these projects is unique. What we do is provide this money to the States in the form of a grant. The States rank order all the projects that they have. We just do the projects that are most cost effective in terms of payback. So, it really varies by project. The technical assistance grants we gave are relatively cheap. The energy conservation measures, actual implementation of the hardware are more expensive projects, and they really vary.

Mr. YATES. Is there any evidence to indicate the States will make investments in energy conservation without Federal support?

Dr. CHIOGIOJI. Up to this point in our discussions with most of the schools and hospitals, they say they are hard-pressed.

Mr. YATES. I am sure they are.

### HUD GRANTS FOR WEATHERIZATION

Are there any areas in the country that aren't covered by HUD grants which would affect the weatherization program?

Dr. CHIOGIOJI. HUD grants for weatherization is dependent upon—the community development block grant money goes to primarily the larger cities. And so, the rural areas would not be covered by that. Also, it really is up to each individual city as to whether it provides any funds for weatherization.

Typically, in the last statistics that I have seen, they have done about 50,000 homes a year.

Mr. YATES. To what extent have the States taken advantage of the ability to use up to 15 percent of low-income fuel assistance for weatherization?

Dr. CHIOGIOJI. That is really hard to say, primarily because the HHS program isn't collecting any of this data per se. They are just providing the money to the States and the States can then decide. So——

Mr. YATES. They don't ask for any information?

Dr. CHIOGIOJI. No.

Mr. YATES. That is kind of silly, isn't it?

Dr. CHIOGIOJI. Well, that is the nature of the block grant.

### WEATHERIZATION CAPACITY

Mr. YATES. What is the current capacity to weatherize homes?

Dr. CHIOGIOJI. Well, the maximum number of homes we weatherized in the past is about 35,000 a month.

Mr. YATES. What is the average cost to weatherize them?

Dr. CHIOGIOJI. Average cost has been around $600 or $700 per unit although we can authorize up to $1,600 per unit. In some places like New York City the costs are higher.

Down South, the costs typically have been $300 or $400 per weatherization. It really varies depending upon the area of the country you are in.

Mr. YATES. Have the costs gone up over the past few years?

Dr. CHIOGIOJI. Yes.

Mr. YATES. What are the reasons, just inflation?

Dr. CHIOGIOJI. Partially inflation and partially, I think, people are doing a better job of analysis.

### ENERGY EXTENSION SERVICE

Mr. YATES. How valuable has the energy extension service program been?

Dr. CHIOGIOJI. Well, the States seem to like the program.

Mr. YATES. They do?

Dr. CHIOGIOJI. Yes, and it has been a cost-shared program as of this year.

Mr. YATES. Should it be continued on a cost-sharing basis?

Dr. CHIOGIOJI. Well, as far as our budget is concerned we are not asking for funds in fiscal year 1983.

Mr. YATES. Does that mean the answer is, "No?"

Dr. CHIOGIOJI. I am sorry?

Mr. YATES. Does that mean the answer is, "No?"

Dr. CHIOGIOJI. Yes, the answer is no.

Mr. YATES. If you had your druthers, you are not allowed to have druthers, are you?

Dr. CHIOGIOJI. No.

Mr. TRIBBLE. Can you imagine a State turning down an offer? I think there have been a few cases——

Mr. YATES. No, I can. I can. The reason I can is because there are so many cost-sharing programs and the State has to make its choice.

Dr. CHIOGIOJI. There has been one that has declined.

Mr. YATES. This might not be the one it would choose. There are highway programs, there are all kinds of cost-sharing programs. As I remember several years ago the States didn't want so many cost-sharing programs because they couldn't provide funding for their share.

How would you rate the energy extension service's contribution in comparison to that realized from the State energy programs?

Dr. CHIOGIOJI. They are two different programs. The State energy program pretty much——

Mr. YATES. Which would you favor?

Dr. CHIOGIOJI. If I had a choice? Oh, the State energy conservation program. I mean that one provides you the mechanism for having a State program per se. The other is providing information.

So, basically you are talking about apples and oranges here. If you were forced with a choice you would go with the SECP.

Mr. YATES. Isn't the energy extension service a cost-effective program?

Dr. CHIOGIOJI. In terms of cost-benefit analysis, it is shown to be that, yes.

Mr. YATES. It is?

Dr. CHIOGIOJI. Yes.

## INVENTORS PROGRAM

Mr. YATES. What are you going to do about the invention program? Are you going to terminate that?

Dr. CHIOGIOJI. Yes.

Mr. YATES. Has it been a valuable program?

Dr. CHIOGIOJI. Yes, there have been at least eight businesses that have been started, initiated and going as a result of that in terms of various techniques that have been developed. We funded between 180 and 200 inventions to date.

Mr. YATES. Some of them are good?

Dr. CHIOGIOJI. Some are very good, yes.

Mr. YATES. Could you put a report in the record?

Dr. CHIOGIOJI. I certainly can.

Mr. YATES. Including how many inventions have been evaluated, the amount of the grants, and the value of the contributions.

Dr. CHIOGIOJI. Yes, sir.

[The information follows:]

Number of inventions, dollars expended, and value of the inventions which have been supported.

### ENERGY-RELATED INVENTIONS PROGRAM

| Fiscal year | Funds (dollars millions) | NBS evaluations conducted | DOE grants |
|---|---|---|---|
| 1977 | 1.8 | 2,532 | 7 |
| 1978 | 3.8 | 3,437 | 22 |
| 1979 | 4.0 | 2,713 | 35 |
| 1980 | 6.4 | 3,292 | 23 |
| 1981 | 5.8 | 1,787 | 39 |
| 1982 | 5.2 | [1] 1,500 | [1] 38 |

[1] Projected.

No comprehensive information exists on the value of the inventions that have been supported. However, a sample of 30 inventions recommended to DOE by NBS has been reviewed. Twenty-nine were supported by DOE. Five of those inventions are already earning revenue, and another 21 are progressing toward the marketplace. The five already successful are earning a combined annual revenue of over $35 million and have generated several hundred new jobs.

Mr. **Yates**. Have any reached a state of development where you can measure success?

Dr. **Chiogioji**. Yes, there are some that have actually been the precursor of businesses that have been started, so that is a measure of success, I guess.

Mr. **Yates**. I take it you are not going to tell me where the weaknesses of your budget are.

Mr. **Tribble**. Well, you know we don't have any.

Mr. **Yates**. You don't have much of a budget. The whole budget is weak when you have that much of a cut. In the budget process you lost $50 million, didn't you? You started out asking for $70 million and wound up with $21 million.

Mr. **Tribble**. Yes.

Mr. **Tribble**. In transportatin you wanted $25 million. You got nothing. What did you lose along the way?

Mr. **Tribble**. R. & D. on electric and hybrid vehicles and work on advanced heavy duty diesels, some of which will do under materials research.

### BUDGET REQUEST

Mr. **Yates**. Would you provide for the record, please, a breakdown of the $17 million—well, you have this too. Let me just say this. You have the sheet which shows what you requested from OMB which shows that you asked for $70 million and finally wound up with $21 million.

Would you itemize for the record, as you did to OMB, your requests for the $70 million and what was lost in the transition?

Mr. **Tribble**. Yes.

Mr. **Yates**. You are allowed to do that under Mr. Davis' injunction?

Mr. **Tribble**. Right.

Mr. **Yates**. All right.

[The information follows:]

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## Energy Conservation
FY 1983 Internal Review Budget Request
(BA in $000)

| | | |
|---|---|---|
| **Buildings & Community Systems** | | |
| Buildings Systems | | $13,591 |
| • Envelope Systems & Utilities | 3,143 | |
| • Ventilation, & Controls | 2,770 | |
| • Performance Calculations & Diagnostics | 3,551 | |
| • Pilot Projects & Case Studies | 900 | |
| • Energy Conservation Equipment | 2,027 | |
| • Test & Evaluation | 600 | |
| • Capital Equipment | 600 | |
| Federal Energy Management Program | | 1,030 |
| Program Direction | | 3,100 |
| Total Buildings and Community Systems | | 17,721 |
| Transportation | | |
| Vehicle Propulsion Technology | | 6,450 |
| • Heavy duty diesel ceramic component research | 1,300 | |
| • Heavy duty vehicle turbo- compounding and bottoming cycle | 1,300 | |
| • Project evaluations/technology assessments | 1,750 | |
| • Diesel ceramics | 2,100 | |
| Electric Hybrid Vehicle RDT&E | | 16,950 |
| • Electric vehicle battery and propulsion systems R&D | 12,150 | |
| • Hybrid vehicle propulsion and component development | 2,900 | |
| • Test and evaluation of advanced technology batteries, controllers and systems | 1,900 | |
| Transportation Systems Utilization | | 990 |
| Program Direction | | 1,260 |
| Total Transportation | | 25,650 |

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| | | |
|---|---|---|
| State & Local | | |
| Program Direction | | 3,065 |
| Total State & Local | | 3,065 |
| Multi Sector | | |
| Energy Conversion and Utilization Technology (ECUT) | | 13,970 |
| • Combustion research | 3,600 | |
| • Heat exchanger research | 1,300 | |
| • Other ECUT research activities related to solvent membrane interactions, enzymes, joining methods for materials | 2,700 | |
| • Automotive ceramic materials research | 3,000 | |
| • Industrial energy research | 2,900 | |
| • Supporting Capital Equipment | 470 | |
| Energy Related Inventions | | 5,513 |
| Program Direction and overhead contract support | | 4,090 |
| Total Multi Sector | | 23,573 |
| Grand Total Energy Conservation | | $70,009 |

I take it there isn't anything else you want to tell us that would——

Mr. TRIBBLE. You have been very thorough.

Mr. YATES. We have questions which we will submit to you which we ask you to reply for the record.

### CLOSING REMARKS

Mr. YATES. I do not know that I have been thorough. I haven't been able to be thorough. I can't get answers on the programs. Mr. Davis has prevented me from really exploring the kind of work that I think would be necessary for the Department of Energy to continue.

I think your budget constraints have straightjacketed you. There isn't much you can do about it in view of OMB. The committee will have to find other ways of getting the information. I do not know how to conduct a hearing under these constraints. It is something I have to give a lot of thought to, as to whether or not to call you back after I bring in outside witnesses and let you comment. I do not think I can do that because I do not think I have the time to do that. We have to hold hearings for all the different agencies within the prescribed rate of time in order get our appropriations bills to the floor and over to the Senate.

So, I do not know how we are going to get any other information, if we are going to try, to get information from outsiders. We may act on their information rather than yours, because while you may have a great deal of knowledge on many of these areas that we take testimony on, you are not being given the opportunity to testify because Mr. Davis says that you can't do it. That is unfortunate. What is happening is that the cooperation that has existed in the past between the Executive Branch and the Congress has broken down.

In the past, we have been able to get extra information that has resulted in better programming, I think, and better cooperation between the Government and industry as a result of moving forward on a great many programs. At this moment I do not know quite how we are going to proceed.

Thank you very much for your testimony.

[Whereupon at 2:40 p.m. the subcommittee adjourned to reconvene subject to the call of the Chair.]

[The questions and answers follow:]

## ADDITIONAL COMMITTEE QUESTIONS

### Impact of Initiatives on Energy Conservation

Question: The justification credits three initiatives as helping to improve the efficient operation of the market for energy. These three are (1) lower taxes, (2) tax credits for R&D and (3) removal of unnecessary regulatory burdens (p. 15). What is your estimate of the energy conservation that can be generated from each of these three initiatives? What is the experience to date that you can relate to us?

Answer: It is impossible to quantitatively estimate the impact of each of these three initiatives. Lower taxes will put more money in the hands of consumers to spend on new vehicles and appliances, all of which will be more energy efficient than the ones they replace. Tax credits for R&D are not focused on specifically energy conservation R&D, but should assist all types of R&D, including energy conservation R&D. Unnecessary regulation hampers business decision-making and thus could easily prevent optimal energy conservation decisions from being made.

All of these initiatives will have interacting impacts, making quantification even more difficult.

## Accelerating Technical Development

Question: According to the budget document, "accelerating the pace of technical development via Federal subsidies for selected R&D projects risks wasting the Nation's resources on technologies that are not yet economically competitive." (p. 15)--Given the long lead times to get new concepts to the market place, wouldn't it be helpful to our economy to accelerate the introduction of energy efficiencies?

Answer: It is the intent of the Administration to concentrate limited Federal funding on fundamental research designed to build a technology base that can provide the foundation for future development of commercial products by the private sector. Market forces will tend to produce those technologies which are most likely to be economically competitive. The realistic energy pricing policies of this Administration, in conjunction with the incentives provided by the Economic Recovery Tax Act of 1981, should provide the proper atmosphere for such free operatior of market forces. Such operation is considered to be the most efficient means by which to achieve the development of those technologies which will be most beneficial to the Nation. Federal involvement in technology development does not tend to be as responsive to market forces and therefore is not considered to be the most efficient means by which to accelerate the development of such technologies.

## Conservation Incentives

Question: What are the current incentives for both individuals and companies to invest in energy conservation activities?

What additional incentives are being proposed by the Administration?

Are any of these incentives proposed for termination?

Answer: The current incentives to encourage individuals and companies to invest in energy conservation activities are:

for individuals, there is an income tax credit of 15 percent of the first $2,000 invested in their principle residence.

for companies, there is an income tax credit of 10 percent in addition to the existing investment tax credit of 10 percent.

The Administration's position is not to recommend additional incentives and to recommend repeal of the business tax incentivies. At the time the energy tax incentives were enacted, price controls and supply allocations were in effect on both crude oil and natural gas and there was substantial resistance to decontrol. Prices paid by consumers for both oil and natural gas were substantially below replacement costs, as reflected by the price of imported oil. Oil imports were growing at the same time that domestic consumption was being subsidized and domestic production discouraged.

However, since enactment of the credits, crude oil prices have been decontrolled. In addition, natural gas prices are being decontrolled under the Natural Gas Policy Act. As a result, the credits, whatever their original justification, are no longer needed because most firms confront prices closer to replacement cost of energy and therefore have more incentive to invest in energy conservation and renewable energy and to purchase alternative fuels without targeted tax incentives.

## Foreign Government Involvement In R&D For Energy Conservation

Question: Please review for the Committee the extent of foreign government involvement in R&D for energy conservation activity.

Answer: The focus of foreign government support for energy conservation appears to be on near-term marketability and export potential with an overall goal of reducing oil imports. Cost-sharing with industry is common in foreign countries. In Japan, public funding for energy conservation is concentrated on energy-intensive industries, namely industrial waste heat recovery. District heating is emphasized in the Federal Republic of Germany, with the German government proposing a 5-year program to subsidize capital investment in plants designed for the generation and distribution of district heat (mainly coal-fired and refuse-fired plants).

Swedish energy RD&D encompasses a broad range of activities from long-term, high risk R&D to demonstration, information transfer and commercialization. Most projects are funded entirely by the government; demonstration and conservation equipment purchase are supported through low interest loans and subsidies. In the United Kingdom a major focus is on industrial conservation, including audits and development and demonstration of conservation technologies, especially waste heat recovery. Building sector conservation includes grants to homeowners for insulating attics and water tanks.

Question: Do foreign countries also have incentives such as are available to industry and individuals in the United States?

Answer: Foreign countries use a variety of energy conservation measures in addition to R&D funding. The Japanese government supports a number of standards, advisory and information programs. An energy management program with 4500 factories participating includes the appointment of energy managers and an energy audit for each factory. Tax incentives and loans are available to reduce the cost to industry of energy-saving equipment. An Energy Conservation Center provides technical advice to industry.

The German government has a $2 billion financial assistance program for homeowners which provides for homeowners to receive a direct rebate from the government of 25% of the cost of conservation measures. As an alternative the homeowner can write off 10% of the cost of the energy saving system each year for 10 years as "depreciation" against his or her taxable income.

Many of these countries, especially Sweden and, to a lesser extent, the United Kingdom, Canada and Japan have adopted similar programs or performance standards, or have mandated or provided financial assistance for audits to encourage energy conservation.

Question: Do they also have basically decontrolled prices of energy? If so, why do other countries see benefit for going ahead with industrial and other R&D programs while the U.S. intends to reduce its R&D activity drastically? Industrial witnesses testified last year and said that without an active government role in promoting industrial R&D in the energy conservation area, high technology products subsidized by foreign governments would take large shares of the domestic market.

-- What is your assessment of these claims?

-- Would the impact of decreased R&D support be more on smaller high technology firms than on industry in general?

Answer: Yes, foreign countries have basically decontrolled prices of energy. A greater emphasis is placed in foreign countries on developing technologies specifically for export or in supporting conservation in industries that must compete in the international market. Therefore, certain high technology products subsidized by foreign governments may compete with U.S. products. We believe that with a realistic energy-pricing policy private industry will undertake energy conservation R&D, except for long-term, high-risk research. U.S. companies will need to continue competing vigorously in both product quality and price to maintain a significant share of the domestic market.

The impact of decreased R&D support is generally felt more by smaller firms, since they are less able than large firms to use limited capital on long-term, high-risk R&D.

## Buildings and Community Systems

The budget justification indicates that individuals, businesses and other institutions have undertaken major conservation efforts. As a result, you no longer see a need for a specific Federal program for buildings and community systems.

Question: What has been the performance since 1973 in the buildings sector compared with transportation and industry?

Answer: Between 1973 and 1980 U.S. energy use for all sectors grew at a rate that was significantly below the pre-embargo growth rate. In terms of Annual Primary Energy Consumption, the consumption in 1980 for each of the end use sectors were within one quad of the 1973 levels and below the peaks experienced in 1978 and 1979. I will submit for the record tables to illustrate the consumption patterns for each year.

Question: What indication do you have from the private sector that they will continue the activities that you have previously funded which you are now terminating?

Answer: The building industry includes major associations that represent the collective interests of builders, architects, engineers, energy suppliers, and manufacturers. Many of these associations already have independent research activities, for example the National Association of Home Builders Research Foundation, the American Institute of Architects Research Corporation, and the American Society of Heating, Refrigerating and Air Conditioning Engineers, the Gas Research Institute, and the Electric Power Research Institute. DOE anticipates that as the Federal R&D activities are reduced, these associations will expand their R&D activities. In addition, private companies, such as General Electric, Honeywell, and Whirlpool, are expected to expand their R&D as higher energy prices stimulate the market for more energy efficient products.

Question: The Committee is concerned about the progress of the programs for which funds are provided in FY 1982. The budget gives no indication of how these programs are being implemented. Could you review for the Committee what you expect to accomplish in FY 1982 in the buildings and community systems program?

Answer: I will submit for the record a Key Activity Summary indicating what is expected to be accomplished with the FY 1982 funds appropriated for the Buildings and Community Systems Program.

Question: For the record, provide a breakdown of each of the dollar amounts for each of the sub-elements under your Buildings Systems program for FY 1982, with a brief description of the work being carried out in each of those sub-elements.

Answer: The Key Activity Summary I will submit for the record also provides that information.

TABLE ANNUAL PRIMARY ENERGY CONSUMPTION BY THE TRANSPORTATION SECTOR, 1950-1980

| | REFINED PETROLEUM PRODUCTS | | COAL, NATURAL GAS, OTHER | TOTAL WITH ELECTRICITY DISTRIBUTED |
|---|---|---|---|---|
| | Million bbl/day | Quads[1] | Quads | Quads |
| 1950 | 3.42 | 7.05 | 1.90 | 8.95 |
| 1951 | 3.77 | 7.76 | 1.79 | 9.55 |
| 1952 | 3.97 | 8.17 | 1.35 | 9.52 |
| 1953 | 4.14 | 8.48 | 1.11 | 9.59 |
| 1954 | 4.28 | 8.68 | 0.82 | 9.50 |
| 1955 | 4.63 | 9.45 | 0.78 | 10.23 |
| 1956 | 4.80 | 9.82 | 0.73 | 10.55 |
| 1957 | 5.02 | 10.22 | 0.63 | 10.85 |
| 1958 | 5.00 | 10.17 | 0.49 | 10.66 |
| 1959 | 5.07 | 10.29 | 0.50 | 10.79 |
| 1960 | 5.09 | 10.04 | 0.48 | 10.52 |
| 1961 | 5.19 | 10.21 | 0.45 | 10.66 |
| 1962 | 5.43 | 10.68 | 0.46 | 11.14 |
| 1963 | 5.64 | 11.09 | 0.49 | 11.58 |
| 1964 | 5.79 | 11.42 | 0.50 | 11.92 |
| 1965 | 5.98 | 11.76 | 0.57 | 12.33 |
| 1966 | 6.34 | 12.47 | 0.61 | 13.08 |
| 1967 | 6.65 | 13.10 | 0.62 | 13.72 |
| 1968 | 7.18 | 14.19 | 0.64 | 14.83 |
| 1969 | 7.50 | 14.77 | 0.69 | 15.46 |
| 1970 | 7.76 | 15.28 | 0.78 | 16.06 |
| 1971 | 8.07 | 15.89 | 0.79 | 16.68 |
| 1972 | 8.53 | 16.83 | 0.83 | 17.66 |
| 1973 | 9.01 | 17.75 | 0.77 | 18.52 |
| 1974 | 8.79 | 17.31 | 0.72 | 18.03 |
| 1975 | 8.91 | 17.55 | 0.63 | 18.18 |
| 1976 | 9.35 | 18.47* | 0.59* | 19.06* |
| 1977 | 9.71 | 19.16* | 0.58* | 19.74 |
| 1978 | 10.15 | 20.04* | 0.57* | 20.61 |
| 1979 | 10.01* | 19.78* | 0.65* | 20.43* |
| 1980 | 9.29* | 18.41* | 0.64* | 19.05* |
| 1981 | 9.13* | 18.02* | 0.63* | 18.65* |

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[1] Derived by multiplying time series in millions of barrels per day by 365(366 in leap years), and then multiplying by thermal conversion factors taken from DOE/EIA Annual Report, cited below @ p. 228. "*" means data updated using figures from EIA Monthly Energy Review, February 1982, p. 26

Source: U.S. DOE/EIA Annual Report to Congress, Volume Two: Data, April 1981, pp. 9, 65.

TABLE ANNUAL PRIMARY ENERGY CONSUMPTION BY THE INDUSTRIAL SECTOR, 1950-1981

| | OIL[1] | GAS[2] | COAL[3] | TOTAL WITH[4] ELECTRICITY DISTRIB. |
|---|---|---|---|---|
| | | (Quadrillion Btu's) | | |
| 1950 | 2.68 | 3.55 | 5.88 | 14.71 |
| 1951 | 3.11 | 4.05 | 6.34 | 16.26 |
| 1952 | 3.11 | 4.18 | 5.62 | 15.74 |
| 1953 | 3.26 | 4.31 | 6.02 | 16.07 |
| 1954 | 3.21 | 4.32 | 4.8[illegible] | 15.3[illegible] |
| 1955 | 3.47 | 4.70 | 5.62 | 17.35 |
| 1956 | 3.60 | 4.88 | 5.67 | 18.02 |
| 1957 | 3.34 | 5.10 | 5.52 | 17.81 |
| 1958 | 3.52 | [illegible] | [illegible] | [illegible] |
| 1959 | 4.02 | 5.65 | 4.39 | 17.98 |
| 1960 | 4.22 | 5.97 | 4.73 | 18.83 |
| 1961 | 4.20 | 6.17 | 4.53 | 18.89 |
| 1962 | 4.39 | 6.45 | 4.57 | 19.63 |
| 1963 | 4.59 | 6.75 | 4.80 | 20.54 |
| 1964 | 4.90 | 7.11 | 5.13 | 21.85 |
| 1965 | 4.94 | 7.34 | 5.36 | 22.66 |
| 1966 | 5.23 | 7.80 | 5.48 | 23.89 |
| 1967 | 5.20 | 8.04 | 5.20 | 24.07 |
| 1968 | 5.40 | 8.63 | 5.12 | 25.19 |
| 1969 | 5.61 | 9.24 | 4.99 | 26.33 |
| 1970 | 5.64 | 9.54 | 5.00 | 26.82 |
| 1971 | 5.64 | 9.89 | 4.30 | 26.75 |
| 1972 | 6.25 | 9.88 | 4.32 | 27.92 |
| 1973 | 6.68* | 10.40* | 4.35* | 29.47* |
| 1974 | 6.51* | 10.01* | 4.05* | 28.75* |
| 1975 | 6.16* | 8.53* | 3.80* | 26.51* |
| 1976 | 6.95* | 8.77* | 3.79* | 28.23* |
| 1977 | 7.69* | 8.64* | 3.50* | 29.03* |
| 1978 | 7.84* | 8.54* | 3.37* | 29.32* |
| 1979 | 9.26* | 8.55* | 3.64* | 31.40* |
| 1980 | 8.81* | 8.45* | 3.30* | 30.21* |
| 1981 | 7.81* | 8.47* | 3.25* | 29.27* |

**Sources:** [1] U.S. DOE/EIA Annual Report to Congress, Volume Two: Data, April 1981, pp. 65, 228; time series in millions of barrels per day were multiplied by 365(366 in leap years) to derive millions of barrels per year, which were then multiplied by thermal conversion factors.

[2] Ibid., pp. 107, 230; time series in trillions of cubic feet per year were multiplied by thermal conversion factors.

[3] Data are from unpublished working files numerically consistent with aggregate data of the 1981 Annual Report to Congress., as reported by Robert Marlay.

[4] EIA Annual Report to Congress, op. cit., p. 9.

"*" means data updated using figures from Monthly Energy Review, February 1982, p. 25

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## TABLE ANNUAL PRIMARY ENERGY CONSUMPTION BY THE RESIDENTIAL/COMMERCIAL SECTOR[1], 1950-1980

| | NATURAL GAS | REFINED PETROLEUM PRODUCTS | PURCHASED ELECTRICITY | COAL | NET CONSUMPTION[3] | TOTAL PRIMARY CONSUMPTION |
|---|---|---|---|---|---|---|
| | | | (Quadrillion Btu's)[2] | | | |
| 1950 | 1.65 | 2.97 | 0.42 | 2.85 | 8.00 | 9.96 |
| 1951 | 2.00 | 3.11 | 0.48 | 2.56 | 8.21 | 10.30 |
| 1952 | 2.21 | 3.24 | 0.53 | 2.27 | 8.36 | 10.57 |
| 1953 | 2.30 | 3.28 | 0.58 | 1.94 | 8.20 | 10.52 |
| 1954 | 2.56 | 3.53 | 0.64 | 1.70 | 8.52 | 10.88 |
| 1955 | 2.85 | 3.88 | 0.71 | 1.68 | 9.18 | 11.60 |
| 1956 | 3.16 | 4.02 | 0.78 | 1.55 | 9.59 | 12.19 |
| 1957 | 3.39 | 3.93 | 0.86 | 1.18 | 9.42 | 12.16 |
| 1958 | 3.80 | 4.39 | 0.92 | 1.17 | 10.23 | 13.08 |
| 1959 | 4.03 | 4.55 | 1.01 | 0.99 | 10.60 | 13.65 |
| 1960 | 4.26 | 5.08 | 1.14 | 0.99 | 11.56 | 14.73 |
| 1961 | 4.48 | 5.22 | 1.20 | 0.91 | 11.87 | 15.17 |
| 1962 | 4.85 | 5.41 | 1.32 | 0.88 | 12.52 | 16.03 |
| 1963 | 5.01 | 5.42 | 1.44 | 0.75 | 12.69 | 16.49 |
| 1964 | 5.33 | 5.33 | 1.57 | 0.65 | 12.94 | 17.00 |
| 1965 | 5.51 | 5.75 | 1.68 | 0.62 | 13.62 | 18.00 |
| 1966 | 5.95 | 5.79 | 1.83 | 0.61 | 14.25 | 19.02 |
| 1967 | 6.47 | 5.98 | 1.96 | 0.51 | 14.98 | 20.10 |
| 1968 | 6.73 | 6.17 | 2.18 | 0.46 | 15.62 | 21.30 |
| 1969 | 7.20 | 6.32 | 2.42 | 0.44 | 16.43 | 22.74 |
| 1970 | 7.46 | 6.48 | 2.64 | 0.37 | 16.99 | 23.94 |
| 1971 | 7.71 | 6.58 | 2.82 | 0.35 | 17.17 | 24.87 |
| 1972 | 7.95 | 6.69 | 3.06 | [illegible] | 18.05 | [illegible] |
| 1973 | 7.63 | 6.75 | 3.30 | 0.27 | 17.96 | 26.62 |
| 1974 | 7.53 | 6.14 | 3.29 | 0.27 | 17.24 | 25.93 |
| 1975 | 7.58 | 5.80 | 3.37 | 0.22 | 16.98 | 26.02 |
| 1976 | 7.87 | 6.28 | 3.50 | 0.21 | 17.89 | 27.22 |
| 1977 | 7.46 | 6.24 | 3.71 | 0.23 | 17.64 | 27.58 |
| 1978 | 7.62 | 6.26 | 3.86 | 0.24 | 17.99 | 28.23 |
| 1979 | 7.90 | 5.02 | 3.94 | 0.21 | 17.07 | 27.48 |
| 1980* | 7.64 | 4.38 | 4.11 | 0.19 | 16.34 | 27.35 |

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[1] Data do not include consumption of wood-derived fuel (other than that consumed by the electric utility industry) which amounted to an estimated 2 quadrillion Btu in 1979.

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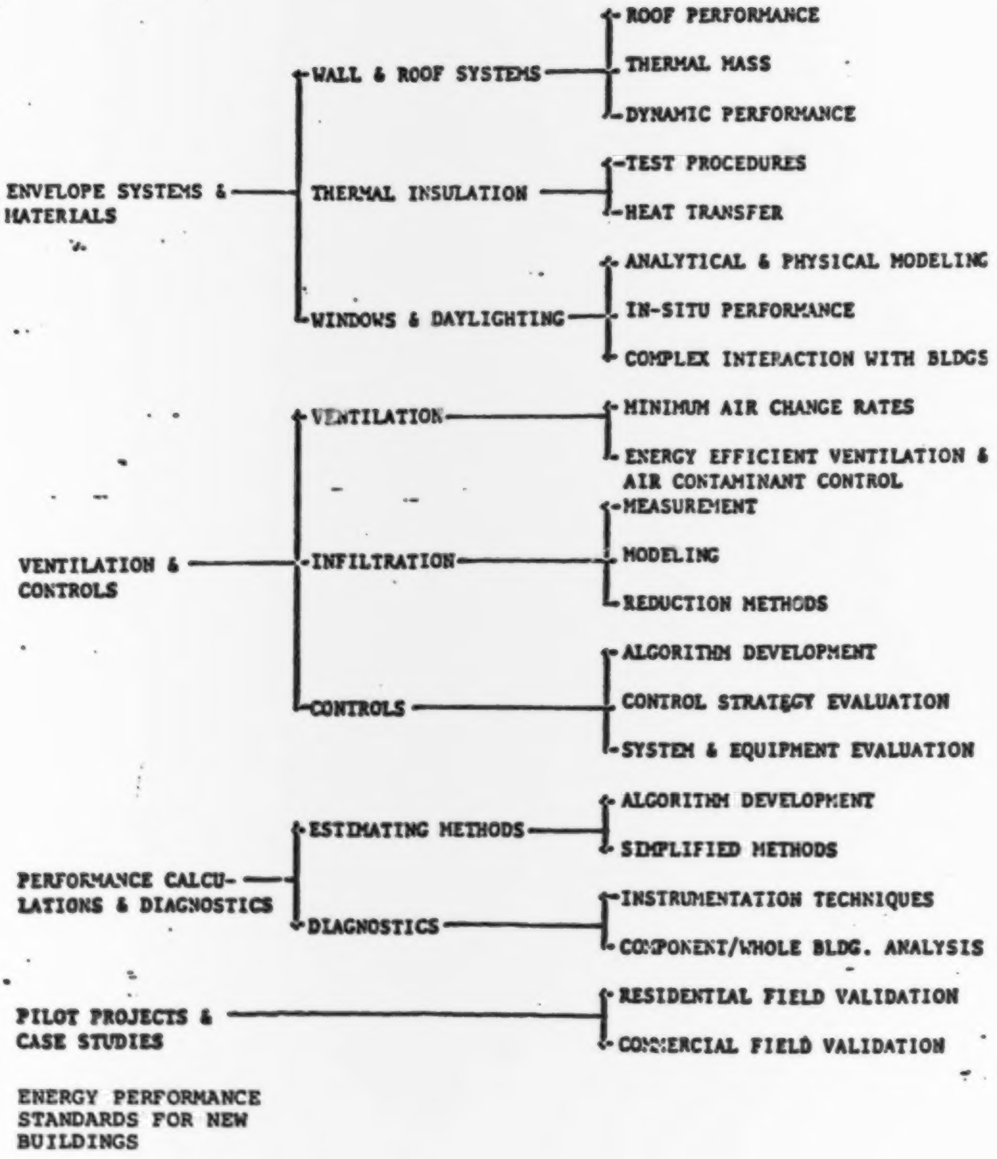
BUILDING SYSTEMS DIVISION PROGRAMS


ENVELOPE SYSTEMS & MATERIALS
WALL & ROOF SYSTEMS
ROOF PERFORMANCE
THERMAL MASS
DYNAMIC PERFORMANCE
THERMAL INSULATION
TEST PROCEDURES
HEAT TRANSFER
WINDOWS & DAYLIGHTING
ANALYTICAL & PHYSICAL MODELING
IN-SITU PERFORMANCE
COMPLEX INTERACTION WITH BLDGS
VENTILATION & CONTROLS
VENTILATION
MINIMUM AIR CHANGE RATES
ENERGY EFFICIENT VENTILATION & AIR CONTAMINANT CONTROL
INFILTRATION
MEASUREMENT
MODELING
REDUCTION METHODS
CONTROLS
ALGORITHM DEVELOPMENT
CONTROL STRATEGY EVALUATION
SYSTEM & EQUIPMENT EVALUATION
PERFORMANCE CALCULATIONS & DIAGNOSTICS
ESTIMATING METHODS
ALGORITHM DEVELOPMENT
SIMPLIFIED METHODS
DIAGNOSTICS
INSTRUMENTATION TECHNIQUES
COMPONENT/WHOLE BLDG. ANALYSIS
PILOT PROJECTS & CASE STUDIES
RESIDENTIAL FIELD VALIDATION
COMMERCIAL FIELD VALIDATION
ENERGY PERFORMANCE STANDARDS FOR NEW BUILDINGS

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| KEY ACTIVITY | PROGRAM TITLE<br>LEAD LAB | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONC. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| ENVELOPE SYSTEMS & MATERIALS | | | | | |
| WALL & ROOF SYSTEMS<br>OBJECTIVE:<br>To understand how the non-steady state transfer of heat, moisture and air through the building s .ll perform under actual conditions | Roof Performance<br>ORNL | Begin roofing field study | Complete roofing field study and initiate roof model.<br>$250 | Same | None |
| | Thermal Mass<br>ORNL/NBS | Continue NBS test site and begin New Mexico site test cells. | Continue testing and analysis on New Mexico and NBS test cells and examine the interaction of mass, size, shape and climate.<br>$365/$50 cap.equip. | Same | Complete testing in cells and analyze the effect of temperature set-back, windows and doors on performance of mass effect.<br>$330 |
| | Dynamic Performance<br>ORNL/NBS | Complete final design and begin construction of NBS calibrate hot box. Tested walls in PCA Hot Box. | Complete NBS calibrated hot box. Measure moisture and condensation in composite envelope systems.<br>$610 | Same | Complete analysis of moisture migration and condensation. and air/moisture transfer in NBS calibrated box.<br>$330 |
| THERMAL INSULATION<br>OBJECTIVE:<br>Develop new and improved test procedures and instruments to determine performance of insulating materials. | Test Procedures<br>ORNL | Began permanency test for cellulose and continued smoldering combustion tests. | Complete development of permanency test for cellulose. Complete studies of smoldering combustion and develop test for ASTM adoption.<br>$275 | Same | None |
| | Heat Transfer<br>ORNL | Continue development of an analytical model of thermal insulation heat transfer. | Continue development of an analytical model of thermal insulation heat transfer.<br>$345 | Same | None |

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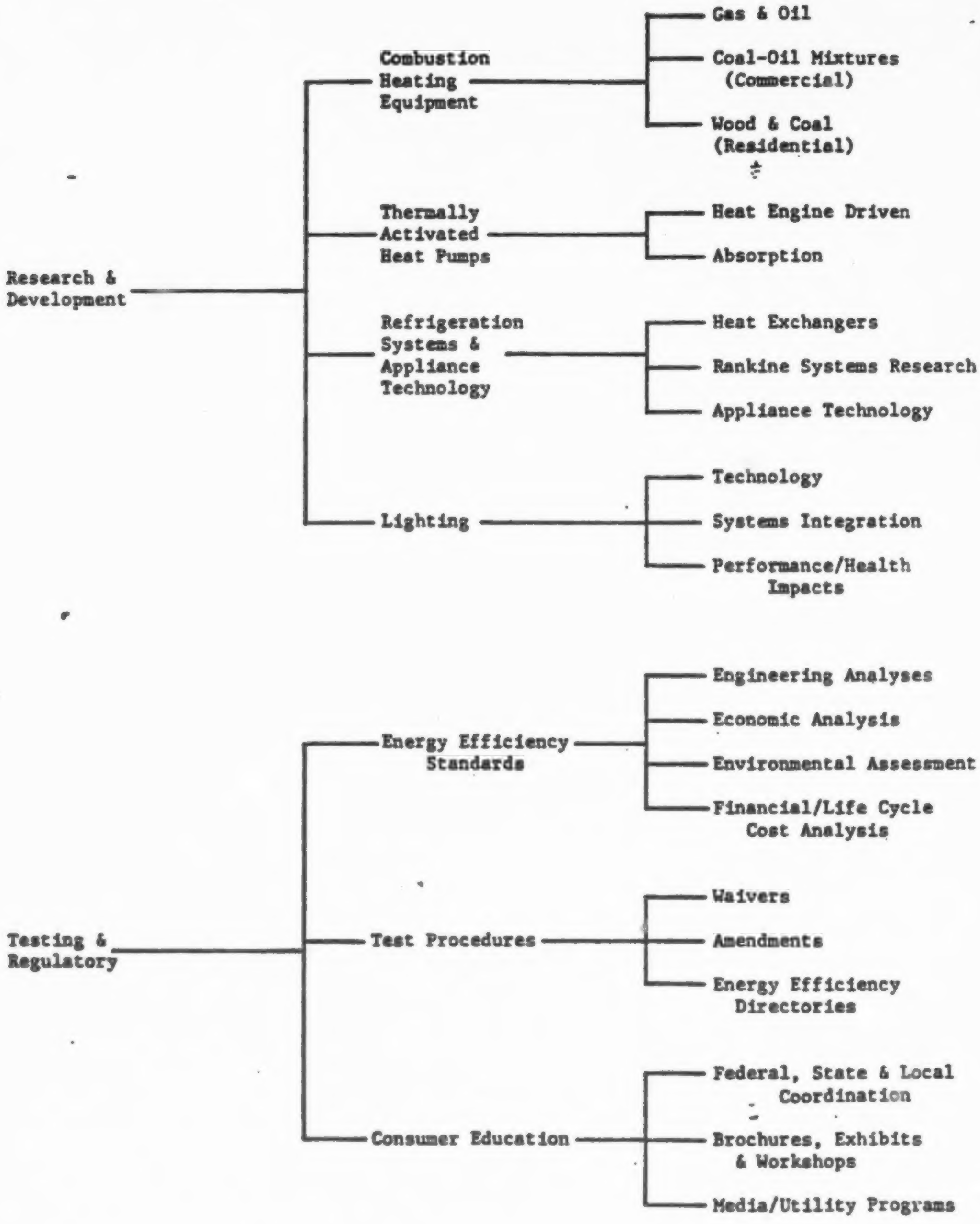
## BUILDING EQUIPMENT DIVISION


Research & Development
Combustion Heating Equipment
Gas & Oil
Coal-Oil Mixtures (Commercial)
Wood & Coal (Residential)
Thermally Activated Heat Pumps
Heat Engine Driven
Absorption
Refrigeration Systems & Appliance Technology
Heat Exchangers
Rankine Systems Research
Appliance Technology
Lighting
Technology
Systems Integration
Performance/Health Impacts
Testing & Regulatory
Energy Efficiency Standards
Engineering Analyses
Economic Analysis
Environmental Assessment
Financial/Life Cycle Cost Analysis
Test Procedures
Waivers
Amendments
Energy Efficiency Directories
Consumer Education
Federal, State & Local Coordination
Brochures, Exhibits & Workshops
Media/Utility Programs

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## BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| WINDOWS AND DAYLIGHTINGS<br>**OBJECTIVE:**<br>To develop an understanding of the complex flow of energy through windows and it's insulation with the building structure, this includes the use of natural daylighting and window management and making this research available to architects and engineers. | Analytical and Physical Modeling<br>LBL | Continue thermal and daylighting model development. Construct artifical sky facility. | Complete addition of 3 new thermal modeling capabilities to our window computer model, THERM, and DOE-2. Complete the addition of a daylight modeling capability to DOE-2 and begin validation of the model. Complete development version of daylighting program, SUPERLITE, and initiate validation. Complete development and validation of artificial sky facility and outdoor model test facility.<br>$530 | Same | Continue development and validation of predictive models for analysis of geometrically complex fenestration, sun control systems and spaces and for variable filtering devices.<br>$240 |
|  | In-Situ Performance<br>LBL | Designed and began to construct MoWiTT. Review and endorsed by industry panel. | Compelte first MoWiTT test module, conduct field calibration and validation tests. Develop instrumentation for field testing of window component and system performance.<br>$375/$75 cap. equip. | Same | Analyse fenestration performance data in winter and summer conditions. Field test window diagnostic equipment. Collect and analyse performance data from daylight buildings.<br>$190 |
|  | Complex Interaction with Buildings<br>LBL | Residential Buildings:<br>Begin the determination of the net annual performance of windows with multi-glazing materials, operable insulating systems, and fixed shading systems. | Residential Buildings:<br>Complete analysis of the net annual performance of windows with multiglazing materials, operable insulating materials, and fixed shading systems.<br>$150 | Same | None |

## BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(AMEND. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY: FY 83 |
|---|---|---|---|---|---|
| WINDOWS AND DAYLIGHTING (cont.) | | Commercial Buildings: Begin analysis of new window and skylight performance in office buildings (energy and peak demand) with insulating and shading devices. | Commercial Buildings: Complete analysis of new window and skylight performance in office buildings with insulating and shading systems.<br>$980 | Same | Same |
| SUBTOTAL | | $1,922,000 | $1,225000 | $1,225000 | $1,070,000 |
| VENTILATION AND CONTROLS | | | | | |
| VENTILATION<br>OBJECTIVE:<br>Determine minimum ventilation requirements and to develop energy efficient, economical ventilation strategies meeting these minimum requirements | Minimum Air Change Rates<br>LBL | Continue development of low cost instrumentation to measure RADON, HCHO, to an air change rate. | Complete development of low cost portable instrumentation for air contaminant measurements, and use instruments in limited field data collection.<br>$640/$135 cap. equip. | Same | In collaboration with EPA, Industry and DOE-BNL collect need data on air contaminant level and ventilation rates with various control strategies.<br>$335 |
| | Energy Efficient Ventilation and Air Contaminant control<br>LBL | Continue Lab and Field heat exchange performance testing. | Complete heat exchanger performance testing of residential heat exchangers.<br>$390 | Same | None |

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BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| INFILTRATION<br>OBJECTIVE:<br>To understand the flow of air through holes in buildings; to develop design and retrofit techniques to reduce the air flow; to devleop test methods and models to determine infiltration rates in buildings. | Measurement<br>LBL | Complete residential measurements. | Develop new long-term averaging instrumentation, and measure infiltration rates in two high-rate office buildings in collaboration with International Energy Agency and U.S. utilities.<br>$410/$50 cap. equip. | Same | None |
|  | Modeling<br>LBL | Complete residential infiltration model. Published in ASHRAE Handbook of Fundamentals. | Complete residential infiltration model, validating it aganist data base of measured values.<br>$500 | Same | None |
|  | Reduction Methods<br>LBL | Quantify infiltration Paths in residential structures. | Analyze low infiltration design strategies in new and existing structures.<br>$190 | Same | None |
| CONTROLS<br>OBJECTIVE:<br>To develop the strategies necessary to control the energy flow in buildings efficiently. | Algorithm Development<br>NBS | Survey state-of-the art of algorithms for energy conserving controls. | Develop energy conserving algorithms for direct digital control of valves, and building air handlers.<br>$120 | Same | None |
|  | Control Strategy Evaluation<br>NBS | Develop control simulation methodology | Evaluate and document the energy efficiency of common control strategies for two buildings in five different U.S. climate locations.<br>$120 | Same | None |
|  | Control System and Equipment Evaluation<br>BNL | Complete pahse 2 zone control study for residential buildings. Complete reliability EMCS study. | Complete residential zone control study and complete commercial case studies.<br>$360 | Same | None |
| SUBTOTAL |  | $3,142,000 | $2,978,000 | $2,978,000 | $335,000 |

BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| PERFORMANCE CALCULATIONS AND DIAGNOSTICS | | | | | |
| ESTIMATING METHODS<br>OBJECTIVE:<br>To develop mathematical models for estimating the heat transfer through the building envelope and of the peakload and partload performance of HVAC equipment; to understand the interactions between HVAC systems, controls and the building envelope and to understand the effect of climate on building energy use; to develop strategies which optimize retrofit selection. | Algorithm Development<br>LBL | Continue DOE-2 program development and completed lab. validation study of HVAC system strategies. | Continue DOE-2 program development, documentation, and complete 2nd phase validation. Develop building prototypes and continue validation of component system performance.<br>$2,934 | Same | Continue DOE-2 program develop and feasibility study of new program development in collaboration with industry.<br>$570 |
| | Simplified Methods<br>NBS/LBL | Completed residential variable degree day based load calculation method and published in ASHRAE Handbook of Fundamentals. | Continue research on simplified methods for residential buildings. Determine if methods can be extended to commercial buildings.<br>$770 | Same | None |

## BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| DIAGNOSTICS<br>**OBJECTIVE:**<br>To develop the theories and strategies for tools needed by and auditor of energy manager to measure the energy performance of a building | Instrumentation Techniques<br>ORNL | Initiate Review of existing sensing/analysis capabilities in non-building area. Com-development of model to analyze infrared flyover results. | Complete review of existing sensing/analysis capabilities in non-building area. Develop diagnostic techniques for evaluating thermal integrity of new bldgs.<br>$300 | Same | None |
|  | Component/Whole Building Analysis<br>ORNL | Completed the assessment and plan for diagnostics program | Continue field study on periodic diagnostics monitoring assessment of building component performance, and complete support to NBS to develop infrared thermography consensus standards through ASTM.<br>$650 | Same | None |
| SUBTOTAL |  |  | $4,854,000 | $4,854,000 | $ 570,000 |
| PILOT PROJECT AND CASE STUDIES |  | $3,050,000 |  |  |  |
| **OBJECTIVE:**<br>To field test concepts developed in other program areas in real buildings under actual conditions; to analyze the relationship between energy efficiency and investment and to analyze the interaction of all building components and systems as they relate to energy | Residential Field Validation<br>BNL | Complete case study on a double envelope convecture loop house. Collect 1st year data on BNL House. | Instrument, analyze, validate and document residential whole building concepts of energy phenomena in vented envelope, superinsulated/restricted infiltration, natural thermal storage and convective loop buildings. Also complete documentation of 20 residential bldg. case study and one on mobile homes.<br>$1,056/$75 cap. equip. | Same | None |

BUILDING SYSTEMS DIVISION

| KEY ACTIVITY | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82(ADMIN. BUDGET) | ESTIMATED ACTIVITY FY82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| 1 | Commercial Field Validation<br>PNL | Developed commercial building plan concept. | Instrument, analyze and validate specific research: in whole builidng energy phenomena in 4 commercial bldg. projects: untested heating/cooling strategies in 4 types in 5 locations; energy flow and interaction in 9 restaurants; office energy mgmt. systems. Complete documentation of 160 bldg. case study.<br>$1,638/$75 cap. equip. | Same | None |
| SUBTOTAL 2 | | $1,274,000 | $2,843,000 | $2,843,000 | $-0- |
| ENERGY PERFORMANCE STANDARDS FOR NEW BUILDINGS | | | | | |
| **OBJECTIVE:**<br>To practice energy performance guidelines for new buildings to be used voluntarily by designers and builders in the development of new building projects. This program is in response to P.L. 94-365, as amended. | Residential Energy Guidelines<br>LBL | None - Deferred Funding | None | Conduct research and analysis leading to the development and issuance of energy guidelines for voluntary use in the development of new residential buildings, including mobile homes.<br>$1,710 | None |
| | Commercial Energy Guidelines<br>PNL | None - Deferred Funding | None | Conduct research and analysis leading to the development and issuance of energy guidelines for voluntary use in the development of new commercial buildings.<br>$5,012 | None |
| SUBTOTAL | | $295,000 | $-0- | $4,722,000 | $-0- |
| TOTAL | | $10,883,000 | $13,900,000 | $18,622,000 | $1,995,000 |

KEY ACTIVITIES - BUILDING EQUIPMENT DIVISION

| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| Research and Development | | | | | |
| Combustion Heating Equipment<br>Objective:<br>Develop generic technologies to improve the efficiency of oil & gas combustion heating systems to 90-95%; to facilitate use of coal-oil mixtures in small-scale (commercial) boilers and to improve the safety and efficiency of residential coal and wood combustion systems.<br>(Program managed by Brookhaven Nat'l Laboratory) | Gas and Oil Combustion | Completed experimental study of metallic materials for condensing systems.<br>Completed proof-of-concept application of heat pipe technology to condensing furnaces. | Complete testing of two-material, non-metallic heat exchangers for condensing systems. | Same | Construct and test a proof-of-concept condensing heat exchanger |
| | | Completed field performance evaluation of improved efficiency oil heating system retrofit options. | None | Continue technology development of low/variable capacity burners. | None |
| | | Completed development & evaluation of low mass boiler concepts.<br>Continued field evaluation of integrated gas space heating/domestic hot water systems. | None | Complete field performance evaluation of integrated gas space heating/domestic hot water systems. | None |
| | | None - deferred funding. | None | Develop a computer model for analyzing the dynamic interaction between the central heating furnace, the distribution system, and the bldg. | None |
| | Coal-Oil Mixtures (Commercial) | Completed preliminary firing test on modified burners and completed subscale tests on a novel recirculation agitation system. | None | Continue work on slurry stabilization with recirculation technology and small-scale ash control systems. | None |

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| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| | Wood and Coal (Residential) | Continued basic wood safety research.<br>Developed requirements for wall protection and completed a hazards study of fireplace inserts. | Continue wood burning fire safety research with a hazards study of creosote fires. Complete wall & floor protection requirements. | Same | None |
| | | Initiated fundamental wood combustion characterization research appropriate to unique wood stove combustion processes. Characterise creosote structure parameters. | Continue fundamental wood combustion characterization and model development. Establish correlation between wood degradation chemistry and combustion products. | Same | None |
| | | Completed draft copy of "Wood Heating Equipment Design Handbook" for improving equipment designs. | None | Continue performance characterization of wood/coal burning equipments and development of design methodologies for high efficiency equipments. | None |
| SUBTOTAL | | $1,600,000 | $600,000 | $1,860,000 | $190,000 |
| **Thermally Activated Heat Pumps**<br>Objective:<br>To advance generic technologies for fuel-fired (thermal) heat pumps with potential space heating "efficiencies" of 120 to 150% (fuel-based coefficient of performance of 1.2 to 1.5)<br>(Program managed by Oak Ridge Nat'l Laboratory) | Heat Engine Driven Technology | Completed testing of a 2nd design free-piston Stirling engine directly driving a freon compressor. | Complete a comprehensive analysis of Stirling engine driven heat pump concepts. | Same | None |
| | | Continue work on an alternate system comprised of a diaphram free-piston Stirling engine and hydraulically driven compressor. | None | Establish proof-of-concept feasibility for diaphram engine-hydraulic drive system. | None |
| | | | Review and validate existing computer codes for free-piston Stirling engines & identify research needs related to heat pump design. | Same | None |

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| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82(CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| | | Completed laboratory tests of a Brayton cycle engine/freon compressor system. Established feasibility of high speed sealing & drive system. | None | Establish technological feasibility of Brayton-cycle driven heat pump system. | None |
| | | Completed laboratory tests of a novel linear Otto cycle engine. Established feasibility of reciprocating seal concept. | None | Establish technological feasibility of linear Otto engine heat pump compressor system. | None |
| | | | None | Initiate comprehensive study & test of internal combustion engine concepts for heat pump drives to define technology readiness and identify advanced research needs. | None |
| | Absorption Technology | Completed laboratory testing a prototype system using conventional fluids. | Complete an analysis of new concepts for a high efficiency absorption cycle. | Complete an analysis of new concepts for a high efficiency absorption heat pump cycle and construct proof-of-concept hardware for one of these. | Complete laboratory testing of advanced cycle & establish proof-of-concept. |
| | | Completed laboratory and field tests of a prototype system using novel organic fluids. | Complete preliminary screening of absorption fluids and assess potential for advanced fluids and systems. | Assess the potential for advanced absorption fluids and develop a model to predict fluid properties of absorption pairs. | None |
| | | Complete a test method for absorption systems for laboratory research purposes. | None | Complete computer code for design evaluation of advanced absorption cycles. | None |
| SUBTOTAL | | $2,500,000 | $750,000 | $3,200,000 | $285,000 |
| | | | | | |

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| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| **Refrigeration Systems & Appliance Technology**<br>Objective:<br>To develop basic data and advance generic technologies applicable to heat pumps, refrigeration systems and appliances.<br>(Program managed by Oak Ridge Nat'l Laboratory) | Heat Exchanger | Initiated testing and characterization of direct expansion ground coils and well water heat pumps. | Complete test of direct expansion ground coils. | Continue analytical, laboratory, and field test work to develop an understanding of ground-coil heat transfer and system design approaches for ground heat sources for heat pumps. | None |
| | | Continued laboratory work to develop a fundamental understanding of frosting and defrosting processes. | Continue to develop understanding of frosting/defrosting phenomena and develop technical concepts to reduce losses. | Same | None |
| | | | None | Establish the technical potential of fluid beds for refrigerant condensing systems | None |
| | Rankine Systems Research | Completed and distributed to industry a second generation heat pump computer design model. | None | Add charge sensitivity and advanced evaporator capability to model. Extend to heat pump water heaters. | None |
| | | | None | Complete a comprehensive analysis of advanced technologies for Rankine systems. | None |
| | | Initiated laboratory work to develop a basic understanding of loss mechanisms. | Continue laboratory and analytical work on cycling losses and develop technical concepts for reducing these losses. | Same | None |
| | | Completed initial laboratory tests to examine the heat transfer phenomena of mixed refrigerants in refrigerators for dual temperature evaporation. | Continue refrigeration-related mixed refrigerant research & extend to heat pump systems where benefits include capacity modulation potential. | Same | None |

| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| | | Developed prototype refrigeration system for commercial application using multiple unequal parallel compressor & microprocessor control which shows a 27% reduction in energy consumption. | None | Establish technological feasibility of advanced commercial refrigeration system through limited field test in a supermarket. | None |
| | | Completed development & test of a motor compressor concept with 44% increase in efficiency for use in refrigerator/freezers. | None | Establish the technical feasibility and research needs of several variable capacity concepts for small compressors. | None |
| | | Completed development of modulating heat pump compressor concepts offering low cost variable speed operation. | | | |
| | Appliance Technology | Completed a laboratory effort to screen advanced insulation concepts - identified two candidates for further research. | Produce & test an insulation panel using the advanced candidate materials. | Same | None |
| | | Continued the development of a novel heat exchanger design which will lead toward a gas water heater with efficiencies over 70%. Continue research on pulse combustion for condensing water heaters with a potential 90-95% efficiency. | None | Produce and test a proof-of-concept pulse combustion water heater. | None |
| | | Completed field test & analysis of heat pump water heaters exhibiting a 50% decrease in energy consumption over standard electric water heaters. | None | None | None |

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| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| | | Completed laboratory tests of a bi-radiant oven concept showing a 50% reduction in energy use and a 66% reduction in cooking time over conventional electric ovens.<br>Completed development of 18 Ft.$^3$ Refrigerator/freezer with 50% reduction in energy consumption. Initiated field test of 25 units. Refrigerator/freezer now in limited production. | None | None | None |
| SUBTOTAL | | $4,040,000 | $1,000,000 | $3,460,000 | $0 |
| **Lighting**<br>Objective:<br>To advance generic technologies for use in advanced lamps and lighting systems and to develop basic data on the potential impacts of high efficiency lighting.<br>(Program managed by Lawrence Berkeley Lab) | Lamp Technology | Developed the laboratory facilities necessary to measure the effects of varying gas isotope mixtures in gas discharge lamps. | Continue applied research in gas isotopes. | Continue applied research in gas isotopes, including the development of a separation process, initiate research in lamp gas mixtures. | Bring to a conclusion all work in gas isotope enrichment. |
| | | | Continue research in high frequency operation of gas discharge lamps. | Continue high frequency operation analysis & filament design including electromagnetic interference (EMI) measurement and analysis. | None |
| | | Complete field demonstration (VA hospital) of dimmable solid state fluorescent ballasts validating energy savings up to 40%.<br>Developed & tested HID solid state ballasts (20% savings) & advanced light bulbs for replacement of incandescents (70% savings). | None | Complete performance characterization tests on several advanced, high efficiency ballasts and light bulbs. | None |

| PROGRAM AREA & OBJECTIVE | PROGRAM TITLE | FY 81 ACTIVITY | ESTIMATED ACTIVITY FY 82 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 82 (CONG. BUDGET) | PLANNED ACTIVITY FY 83 |
|---|---|---|---|---|---|
| | Systems Integration | Completed & verified a computer program to be used by designers predicting energy savings using a variety of lighting strategies. | Complete analysis of lighting control systems demonstrations and publish reports. | Same | |
| | | | None | Conduct research in advanced lighting design; compile component (lenses, reflectors) performance data and study light source mixtures in system design. | None |
| | Impacts | Initiated experiments to assess the effects of various lighting parameters upon visual fatique, and the photobiological effects of novel lighting systems on humans. | Continuation of visual performance & photobiological research, report initial results. | Same | None |
| SUBTOTAL | | $1,300,000 | $590,000 | $2,040,000 | $95,000 |
| **Misc. Activities**<br>Funds transferred to other technical programs/taxes | | $3,230,000 | -- | -- | -- |
| TOTAL - R&D | | $12,670,000 | $2,940,000 | $10,560,000 | $570,000 |

*Footnote: The FY 83 funds ($600,000) are budgeted under "Combustion & Energy Conversion" in the Office of Energy & Utilization Technology Program

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## BUILDING SERVICES DIVISION PROGRAM

Residential Conservation Service

Retrofit R&D

Low Cost Retrofit Measures

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## TEST AND EVALUATION BRANCH

| Key Activity | Project Title | Activity FY81 | Estimated Activity FY 82 (Admin Budget) | Estimated Activity FY 82 (Cong Budget) | Plannnd Activity FY 83 |
|---|---|---|---|---|---|
| Improve Operating Efficiencies of Major Household Appliances<br>Objective: To increase overall operation efficiency through the establishment of minimum energy efficiency performance standards. (Program support may be provided by: Science Application Inc. Lawrence Berkley Labs. Pacific Northwest Labs.) | Promulgate Energy Efficiency Standards for Eight Types of Consumer Products. | Awarded (8) contracts to support development of documentation to substantiate whether there is a need for standards - economic and engineering analyses, macro and micro economic analyses to determine impact on appliance industry and national economy, environmental assessment study, and financial life cycle cost analysis. | None | Prepare proposed and final rulemakings (as well as technical support documents) for eight types of consumer products. Prepare proposed and final rulemakings for the five remaining product types plus heat pumps. | |
| | | | None | Participate in public hearings regarding proposed rulemakings | |
| | | | None | Evaluate impact of FTC labeling program and other consumer awareness activities and update ORNL Residential Energy Use Model (or alternate) to project residential energy use by product type and fuel type. | |
| | | | None | Process state applications for waivers from the provisions of the Federal standards and perform related required analysis (Subtotal: $575K) | |
| Objective: Develop standardized test methods for determining energy efficiency, energy use, and estimated annual operating costs of a covered product. (Program support may be provided by: National Bureau of Standards Science Application Inc. | Develop, modify, and maintain test procedures for consumer products. | Awarded (4) contracts to support development or amendment of test procedures for consumer products - amend existing or develop new methods of testing for new designs or modified designs to existing products, review petitions for waiver from DOE test procedures, recommend alternate test methods to accommodate petitioners requests, develop procedures to determine the effects of cyclic operation | Continue to develop, modify and maintain test procedures with emphasis on CAC, furnaces water heaters, and refrigerators. Analyze applications for test procedure waivers. | Expand to include field and laboratory test programs to improve test methods. | |
| | | | Continue to evaluate CAC and heat pump test procedures to reduce test burden and to increase accuracy and repeatibility. | Same, plus an additional evaluation of the continuous fan test method. | |

| Key Activity | Project Title | Activity FY81 | Estimated Activity FY 82 (Admin Budget) | Estimated Activity FY 82 (Cong Budget) | Planned Activity FY 83 |
|---|---|---|---|---|---|
| Arthur D. Little, Inc.<br>Purdue University<br>Energy Applications Inc.) |  | and demand defrost on energy consumption of CAC's and heat pumps, conduct field testing of purgeable, pulse combustion and condensing furnaces and develop methods of test to determine efficiency ratings and annual operating costs, conduct study to define utility and performance for 13 consumer products and develop energy efficiency directories for refrigerators, furnaces, water heaters, and room air conditioners. | Continue development of test procedures for low thermal mass furnaces, purgeable boilers and consending furnaces and boilers.<br>Modify water heater test procedures to provide a method of test for heat pump water heaters.<br>Prescribe a final rule for home heating equipment test procedures. | Same<br>Same<br>Same<br>Evaluate manufacturers' data submitted to FTC for technical accuracy and recommend improvements to the labels which will better inform the consumer of product efficiency.<br>Complete documentation of the CAC/HP seasonal performance and component balance models.<br>(Subtotal: $1,057K) |  |
| Objective: Educate consumer on the understanding and use of Energyguide Labels in comparison shopping for major household appliances.<br>(Program to be conducted utilizing in-house resources) | Develop and Implement Consumer Education/ Public Awareness Programs Regarding The Energyguide Labels. | Conducted workshops and conferences for state and local governments, consumer groups, manufacturers' and educators on the Energyguide Label. (Held 10 workshops throughout the Nation.)<br>Produced brochures, exhibits, and library displays aimed at explaining the labeling program to consumers.<br>Worked with radio and television stations regarding talk | Cooperate with Federal Trade Commission, industry, trade associations and public interest groups to assure maximum dissemination of consumer information. | Same |  |

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| Key Activity | Project Title | Activity FY81 | Estimated Activity FY 82 (Admin Budget) | Estimated Activity FY 82 (Cong Budget) | Planning Activity FY 83 |
|---|---|---|---|---|---|
| | | shows to inform and educate consumers on consumer product energy efficiency and the Energyguide Labeling program.<br>Worked with utilities to imimplement energy savings campaign with bill stuffers, and others for publication of articles in journals, preparation of retail training programs, development of colleges and universities cirriculum on energy conservation programs, and with extension services to disseminate energy conservation and related information. | | (Subtotal: $0) | |
| Total Testing & Regulatory | | $ 4,082,000 | $ 520,000 | $ 1,632,000 | 6 |
| | | | | | |
| Total Building Equipment Division | | 16,752,000 | $3,460,000 | $12,192,000 | $590,000 |
| | | | | | |

| Key Activity | Project Title | FY 1981 Activity | Estimated Activity FY 1982 (Adm. Budget) | Estimated Activity FY 1982 (Cong. Budget) | Planned Activity FY 1983 |
|---|---|---|---|---|---|
| **Residential Conservation Service and Related Regulatory Act.** | | | | | |
| Objective: Meet the statutory requirements of the RCS law. Provide flexibility within the limits of the law. Minimize burden on States and Utilities | RCS Rulemaking<br>ORNL | Issued rules for the preparation of State and non-regulated utility plans for offering home energy audits and other services. Initiated a revision in the rules that increases the flexibility and reduces costs and burdens. | Issue revised rules, conduct hearings, issue final rules (Minimal analyses of issues raised at hearings). | Same, but with a fuller examination of issues raised at the hearings.<br>$450 | None |
| | RCS Plan/Temporary Program Review<br>ORNL | Completed review and approval of 41 State and 33 Utility RCS plans; disapproved 2 State RCS plans; granted approx. 100 exemption/waiver requests | None | Complete review and approval of approx. 8 State plans, 20 temporary programs, 60 plan amendments and 10 waiver requests<br>$200 | None |

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| Key Activity | Project Title | FY 1981 Activity | Estimated Activity FY 1982 (Adm. Budget) | Estimated Activity FY 1982 (Cong. Budget) | Planned Activity FY 1983 |
|---|---|---|---|---|---|
|  | RCS Monitoring<br>ORNL & SERI | Received and analyzed initial State and Utility annual reports completed first annual report to Congress; completed first program status report | None | Complete analysis of second year annual reports, complete second annual report to Congress; complete two RCS program status reports; investigate 4 cases of alleged anticompetitive activity.<br>$200 | Final report on regulatory activities would be issued |
|  | RCS Federal Standby<br>ORNL | Proposed Federal Standby Plan and received public comment (announced that plan would be reproposed in 1982) | None | Repropose Federal Standby Plan; receive and analyze public comment; prepare implementation plan<br>$500 | None |
|  | CACS Rulemaking<br>ORNL | Proposed rules to implement CACS; received public comment and prepared draft final rule; issued draft regulatory analysis and draft EIS for CACS program | None | Repropose CACS rule; revise regulatory analysis and EIS; receive and analyze public comment; develop technical materials to assist States/utilities<br>$450 | None |
|  | RCS Program Evaluation<br>ORNL | Preliminary Evaluation Plan prepared. Exploratory contacts with utilities initiated | None | Establish RCS Evaluation Coordination group (EEI, APPA, AGA, Natl. Governor's Conf) to finalize plan and monitor evaluation of RCS progress at the State and utilities levels<br>$1,200 | None |

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Subtotal $3,000,000

| Key Activity | Project Title | FY 1981 Activity | Estimated Activity FY 1982 (Adm. Budget) | Estimated Activity FY 1982 (Cong. Budget) | Planned Activity FY 1983 |
|---|---|---|---|---|---|
| Retrofit Research and Demonstrations | | | | | |
| **Objective:** Conduct research on innovative ways to achieve retrofit of residential and commercial buildings, and present the results to private entrepreneurs | Residential/ Commercial Retrofit Project | Analysis and design of research plan for residential project | Enter cooperative agreements for case studies of various technical practices and business arrangements for delivering conservation services. Disseminate results of case studies. Directed research to solve specific, practical retrofit problems | Same<br>$360 [illegible] | None |
| | | Design innovative financing research plan | Identify, evaluate and test alternative financing mechanisms potentially applicable to commercial, industrial and multi-family buildings with focus on legal, financial, and institutional barriers. | Same | None |
| | | Design DOE Utility Apartment Retrofit Project | Assist in weatherization of non-owner occupied apartment building through a utility to test impact of accelerated delivery method on fuel use, peak demand and landlord/tenant/utility relations | Same | None |
| | | Survey alternative delivery systems and candidate service firms | Collect data from 64 firms offered innovative commercial retrofit delivery. Conduct on-site visits of six offering best opportunities for economic viability. Analyze results and complete report. | Same | None |

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subtotal $360,000

## FEDERAL & COMMUNITY SYSTEMS DIVISION PROGRAM

District Heating

Integrated Community Energy Systems

Community Energy Planning & Management

Energy Impact Assistance

Federal Energy Management Program

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| Key Activity | Project Title | FY 1981 Activity | Estimated Activity FY 1982 (Adm. Budget) | Estimated Activity FY 1982 (Cong. Budget) | Planned Activity FY 1983 |
|---|---|---|---|---|---|
| | | Multi-family research; collected and analyzed data to determine preceived barriers and solutions to conservation in rental housing. Initiated longer term research to strengthen conservation incentive techniques. | Collect data on differences in properties with tenant-paid and owner-paid utilities; and savings associated with different methods of direct tenant billing; sensitivity of rents to energy prices. Evaluate data; document and assemble results to impact of energy efficiency on rental competition. | Same | None |
| | Home Energy Rating/Primary Lenders Training program (HERS) | Gained joint housing and financial industry support to promote voluntary use of a national home energy rating system. | Complete research on existing systems; pilot test several systems; identify features of a national rating system. | Same | None |
| Objective: Obtain utility support for the financing of energy retrofit costs | Residential Energy Efficiency Plan (REEP) | Private company audited 1000 individual New Jersey homes developing appropriate strategies. Proposed rule issued, comments received. | Company will hire local contractors to install conservation measures free of charge; begin project evaluation. Issue final rule. | Same | Complete DOE support role by June/July 1983; issuance of Evaluation report |
| Objective: Meet the Legislative Rqt. that Treasury shall consult with DOE in the analysis of tax credit appl. for energy conservation measures | Energy Tax Credit | Completed engineering analysis of 4 appl. received from IRS and made recommendations. Completed economic analysis of 3 appl. received from IRS and made recommendations | Continue economic and engineering analyses of tax credit applications | Same | None |

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| Key Activity | Project Title | FY 1981 Activity | Estimated Activity FY 1982 (Adm. Budget) | Estimated Activity FY 1982 (Cong. Budget) | Planned Activity FY 1983 |
|---|---|---|---|---|---|
| **Develop Low Cost Retrofit Measures** | | | | | |
| Objective: To provide homeowners a combination of 50 low cost retrofit measures that are inexpensive and are expected to save 25-50% of the home's energy usage | 50/50 Program | Provided step by step instruction as to how to install each measure.<br>Offered to small utilities and electrical co-ops that are not covered by RCS program, the 50/50 Program. | Close out DOE participation and allow voluntary support by small utilities and electric co-ops. Receive final report. | Distribute final report and, as appropriate, develop guidance describing each of the 50 items. Work with distribution in providing training | Complete DOE support role |
| Subtotal | | | $3,000,000* | | |
| Total | | | 3,000,000 | $3,360,000 | |

*Unobligated FY 1981 carryover

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## FEDERAL AND COMMUNITY PROGRAMS

| KEY ACTIVITY | PROJECT TITLE | FY 1981 ACTIVITY | ESTIMATED ACTIVITY FY 1982 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 1982 (CONG. BUDGET) | PLANNED ACTIVITY FY 1983 |
|---|---|---|---|---|---|
| District Heating<br>Objective: To resolve impediments faced by market forces in their quest to implement District Heating and Cooling. | DOE/HUD 28-City Feasibility Studies | Issue grant awards to cities. Developed technical support teams at ORNL and ANL. Visited cities and developed technical support plans for each city. | Provide technical support developed in city plans. Develop technical support materials useful for any city considering district heating and cooling. Plan and execute closedown of project. | Monitor contract close-out (carryover funds) | None |
| | Cogeneration Retrofit for: Detroit, MI; Newark/Jersey City, NJ; Bridgeport, CT; Piqua, OH; Moorhead and Redwing, MN. | Worked on preliminary design. | Complete preliminary design; assist in making financial (not DOE) arrangements for construction (carryover funds). | Monitor contract close-out (carryover funds) | None |
| | St. Paul, MN (No DOE Funds) | Finished making arrangements for financing construction. | Monitor State construction; transfer technical information (carryover funds). | Same | None |
| | MN and MI State District Heating Plans | Awarded contracts | Complete final report on State actions needed to implement plans (carryover funds). | Same | None |
| SUBTOTAL | | $2,700,000 | $2,000,000 | $ 0 | $ 0 |

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## FEDERAL AND COMMUNITY PROGRAMS

| KEY ACTIVITY | PROJECT TITLE | FY 1981 ACTIVITY | ESTIMATED ACTIVITY FY 1982 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 1982 (CONG. BUDGET) | PLANNED ACTIVITY FY 1983 |
|---|---|---|---|---|---|
| Integrated Community Energy Systems (ICES)<br>Objective: To develop operational data on small co-generation integrated energy systems for commercial and community systems. | Georgetown ICES | Monitor feasibility study contract. | None | Issue contract for final phase of project (turbine for cogeneration); supervise contract. | Monitor contract closeout (carry-over funds). |
| | Scranton | Issued planning grant to to study technical, legal and environmental impediments | None | Issue grant for next phase of project (drilling to determine adequacy of mine water supply). Complete report on first five tasks. | Monitor contract closeout (carry-over funds). |
| | U. of MN | Monitored construction; designed monitoring and implementation system. | Same | Same | None |
| | Clark U. | Monitored construction | Monitor first year of operation (carryover funds). | Same | None |
| | Trenton, NJ | Finalized arrangements for project financing; signed contract for construction | Monitor construction; transfer results to private sector (carryover funds). | Same | None |
| | Technical Components Analysis | Conduct analysis of system components. | Receive final reports; transfer results to private sector (carryover funds). | None | None |
| SUBTOTAL | | $3,200,000 | $ 0 | $2,000,000 | $ 0 |

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## FEDERAL AND COMMUNITY PROGRAMS

| KEY ACTIVITY | PROJECT TITLE | FY 1981 ACTIVITY | ESTIMATED ACTIVITY FY 1982 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 1982 (CONG. BUDGET) | PLANNED ACTIVITY FY 1983 |
|---|---|---|---|---|---|
| Community Energy Planning and Management | | | | | |
| Objective: Provide technical information to communities and business to support cost effective energy management | Community Energy Management Handbook | Collected information; conducted analysis. | Prepare handbook/ transfer information to private sector (carryover funds). | Same | None |
| | Energy Efficient Community Development | Collected data; conducted analysis | Held workshop; continue analysis (carryover funds). | Same | None |
| | City Energy Management (Urban Consortium) | Collected data from participating cities; conduct analysis. | None | Provide city grants, data collection, analysis and prepare final report. | Monitor contract closeout (carryover funds). |
| | CCEMP (Comprehensive Community Energy Management Program) | Completion of demonstrations, implementation of case studies, development of guidance material, and assessment of case studies. | Completion of case studies; prepare guidebook, transfer information to private sector (carryover funds). | Same | None |
| | SAND (Site and Neighborhood Design) | Develop regulation case studies (8), and completion of assessment and guidance work. | Completion of case study assessments and transfer of guidance material to the private sector (carryover funds). | Same | None |
| | Energy Partnership for American Cities | Completion of Pilot Study-Designed to influence Chambers of Commerce Executives. 75 Chambers adopted the program. | Project figures indicated that 300 local Chambers of Commerce will plan and implement their program to provide energy management assistance to the business community. | Same | Monitor contract closeout (carryover funds). |

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## FEDERAL AND COMMUNITY PROGRAMS

| KEY ACTIVITY | PROJECT TITLE | FY 1981 ACTIVITY | ESTIMATED ACTIVITY FY 1982 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 1982 (CONG. BUDGET) | PLANNED ACTIVITY FY 1983 |
|---|---|---|---|---|---|
| | National Conference of Black Mayors, Inc., Energy Conservation Project | Assessment of appropriate response to energy issues in seven black-managed communities. | None | None | None |
| | Operation Powerplay (No DOE Funding) | 3-Energy Coops Operating<br>2-Organized and completed initial cost/benefit studies and approaching operational status.<br>2-Various stages of organizing<br>6-Presently evaluating the program | Monitor project closeout | Monitor project closeout | |
| SUBTOTAL | | $7,800,000 | $ 0 | $2,000,000 | $ 0 |
| Energy Impact Assistance<br>Objective: Manage grant program to localities for planning, site acquisition and development in areas impacted by coal and uranium development. | Energy Impact Assistance | $10 million appropriated; approx. 100 grants allocated: 25 planning, 15 site acquisition, 25 site development, 35 combined site acquisition and development. | Monitor contract closeout and write final report (carryover funds). | Same | Complete final report (carryover funds). |
| SUBTOTAL | | $10,000,000 | $ 0 | $ 0 | $ 0 |
| COMMUNITY SYSTEMS PROGRAMS: TOTAL | | $23,700,000 | $2,000,000 | $4,000,000 | $ 0 |

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## Building Energy Performance Standards

Question: What are the requirements of the law for the building energy performance standards?

Answer: The law requires DOE to issue interim standards which are to be mandatory for Federal buildings but voluntary for non-Federal buildings; conduct a residential and commercial demonstration program for at least a year; report the findings of the demonstration program to Congress; and issue final voluntary standards by April 1, 1984. These final standards are to be accompanied by suggestions from both HUD and DOE on how they should be implemented. HUD is also required to report to the Congress, on a semiannual basis, the progress States are making toward the adoption of building codes and standards.

Question: Have you met the requirements of the law?

Answer: The Department of Energy is in the process of developing interim standards. There has been no Congressional appropriation for a demonstration program.

Question: How far along are you in developing voluntary standards for residences, mobile homes and commercial buildings?

Answer: DOE has considerable work in place regarding voluntary standards for residences, mobile homes and commercial buildings. Energy analysis by Lawrence Berkeley Laboratory of 5 prototypical residences in 19 to 51 cities has been underway since FY 1981. This work analyzes 15 to 17 conservation strategies in each of the prototypes and cities. Sensitivity analyses on other design approaches such as variation in glazing, thermal mass, equipment efficiency, domestic hot water, and levels of infiltration will begin soon. This data will be the foundation for guidelines for use by homebuilders. A contract award to begin planning and development of the builder guidelines is expected within days.

Considerable mobile home work has already been completed utilizing FY 1981 funds. This work, by the National Institute of Building Sciences (NIBS), analyzed prototypical mobile homes in 10 cities. A contract award to complete this work and develop mobile home dealer/manufacturer guidelines from it is also expected within days. The new work will complete energy analysis and perform sensitivities on conservation strategies such as amount of glazing, equipment efficiencies, domestic hot water, and levels of infiltration. The dealer/manufacturer guidelines will be built on this analytical data.

The commercial building standards will utilize much building energy performance standards work that has been completed including test reference buildings from the original data base;

the DOE-2.1B energy analysis tool; a life-cycle cost model developed by Oak Ridge National Laboratory; and standardized data on how buildings are operated. Energy analysis will be performed on 10 reference buildings in 5 to 6 climates. Approximately three heating, ventilating, and air-conditioning systems will be analyzed for each building. Sensitivity analyses on other parameters such as exterior envelope, equipment, and lighting will be performed.

This analysis will be used to develop proposed modifications to the component performance standard ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers) 90. An earlier version of this Standard, ASHRAE 90-75, is in the building codes of 47 States. An appendix of whole-building building line energy budgets will also be developed. This project is fully funded and underway. It is being project-managed by Battelle Pacific Northwest Laboratory.

Question: What type of research and analysis is involved in developing the voluntary standards?

Answer: The research and analysis is a continuation of the technical studies undertaken to develop potentially mandatory standards. Residential and commercial buildings and mobile homes are grouped into different types of buildings based upon their functions and major design features. Representative and prototypical buildings are identified for each of these groups. The energy requirements of these buildings are estimated. A series of design changes are then assumed and the energy savings from these changes are estimated. These buildings are then assumed to be located in different geographical areas to estimate the effects of climate variations. The results show that energy savings expected from changes in the Congressional direction to develop voluntary standards have led to greater emphasis on technical studies and reduced attention to economic and regulatory analyses. The current work is now more closely coordinated with building industry groups such as the National Institute of Building Sciences, the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), the American Institute of Architects (AIA) and others.

Question: Will you have issued these voluntary standards by the end of FY 1982?

Answer: DOE plans to issue interim voluntary standards for mobile homes near the end of FY 1982 and interim voluntary standards for residential and commercial buildings in the spring of FY 1983.

Question: What staff will be available in FY 1983 to complete the voluntary energy standards?

Answer: The FY 1983 budget contains no request for manpower in support of this program.

## Residential Conservation Service

Question: If the program were to continue, what do you think are the most essential Federal elements that should remain in place?

Answer: The Administration does not support continuation of the Residential Conservation Service (RCS) or the Commercial and Apartment Conservation Service (CACS) in any form because it believes that none of the programs' mandatory requirements is essential. While some of the energy audit and other services now required by the programs are likely to be continued by States and utilities voluntarily, many States and utilities will certainly choose to alter these services substantially if the Federal mandate is removed. The continuation of the Federal regulatory program in any form will hinder the ability of these States and utilities to make independent judgements regarding the most appropriate types of conservation services to provide to residential and commercial customers in their area.

Question: What are the regulatory requirements of the program?

Answer: The statutory requirements of the program are set forth in Title II, Part I of the National Energy Conservation Policy Act (NECPA), as amended, in Title VII of NECPA, and in Department regulations contained in 10 CFR 456. Departmental regulations covering RCS Standby and the CACS program have not yet been issued.

The requirements imposed by the legislation, as well as by our own regulations, are far too numerous to list here, but I will submit for the record a copy of the bulk of the existing RCS program regulations (issued on Nov. 7, 1979) and the substantial revisions to these regulations which were published Nov. 12, 1981. [Note: These will be retained in the committee files.]

The key regulatory requirements of the RCS program are that major natural gas and electric utilities: offer on-site home energy audits to their residential customers for a charge of $15 or less; provide a list of contractors and lenders to each audited customer; and offer assistance to each audited customer in financing and contracting for the installation of conservation and solar measures. States and participating contractors and lenders are also required to provide certain other services and consumer protections.

The key regulatory requirement of the CACS program is that major natural gas and electric utilities offer an on-site energy audit to their small commercial customers and to residential customers in larger apartment buildings. The charge to customers for this audit is to be determined by the State regulatory authority or non-regulated utility.

DOE also is required by statute to implement Federal Standby in States that have chosen not to participate in RCS or CACS or where the programs are being inadequately implemented.

Question: In what ways do you think the service could be improved to make it more effective?

Answer: States, local governments and utilities are in the best position to judge what specific steps could be taken to improve the effectiveness of RCS and CACS. Therefore, at a minimum, substantially greater flexibility should be provided in the Federal implementing regulations. The Department has proposed amendments to the existing RCS regulations designed to maximize this flexibility. DOE expects to issue final revised RCS regulations by June of this year. Federal Standby regulations for the RCS will be issued this summer. The Department will issue a new proposal for CACS regulations this summer. Final rules will be issued expeditiously. Federal Standby regulations for CACS will be issued soon after promulgation of CACS final rules.

## Appliance Standards

Question: Recent newspaper articles have indicated that you have chosen to develop no standards in the home appliance area.

-- Please explain to the Committee what the current state of the appliance standards program is?

-- What studies were used to come to the determination that the standards would not be economically sound and would not result in energy savings?

-- What factors changed to give a result which differs from the results of a similar study done by the Carter Administration?

Answer: DOE has proposed in the Federal Register (47 FR 14424, April 2, 1982) that an energy efficiency standard for refrigerators, refrigerator-freezers, freezers, clothes dryers, water heaters, room air conditioners, kitchen ranges and ovens, central air conditioners, or furnaces would not result in a significant conservation of energy or would not be economically justified. Comments on this proposed rule are being accepted by the Department until June 16, 1982. For an additional 45 days, comments on these comments will be accepted. DOE believes that this additional 45-day period will ensure a broad range of public viewpoints on the proposal.

DOE conducted an engineering and economic analyses based upon the comments and data submitted in response to the June 30, 1980, proposed rule. The results of these analyses are presented in the Economic Analysis Document and Engineering Analysis Document. These documents were prepared by DOE to support the April 2, 1982, proposed rule and are referred to throughout the notice.

DOE has made a number of revisions to the analysis conducted in support of the 1980 proposal. They include changes to both the engineering and economic analyses and are described in detail in the Engineering Analysis Document and the Economic Analysis Document. While no specific analyses have been conducted as to what changes had the greatest impact, DOE believes that the use of new fuel prices (National Energy Policy Plan, DOE/S-008, July 1981) and lowering of the possible standards had the greatest impact.

A copy of the Federal Register notice will be submitted for the record. Note: It will be retained in the committee files.

## Federal Energy Management Program

Question: Why do you propose to terminate the Federal Energy Management Program?

Answer: The Administration does not intend to terminate the Federal Energy Management Program, although no funds have been specifically requested in the FY 1983 budget. The Federal Energy Management Program will continue, but will be decentralized to the major energy-using Federal agencies involved in this important program. Their participation will continue to insure that energy efficiencies are achieved to eliminate energy waste and to accrue dollar savings in energy use avoidance. The Federal agencies, especially the Department of Defense as the leader in energy conservation and efficiency efforts, are committed to energy conservation, energy efficiency, and greater utilization of renewable energy resources to reduce dependence on foreign energy resources. The Federal Energy Management Program is now a well-established part of Federal agency management activities.

Question: Are energy conservation projects in the Department of Energy being increased or decreased in the FY 1983 budget?

Answer: The DOE In-House Energy Management Office project budget has been decreased from $19.7 million in FY 1982 to approximately $10 million in FY 1983.

Question: Do you have information on whether other Federal agencies have increased or decreased the value of conservation projects in the FY 1983 requests?

Answer: DOE does not have detailed information on how Federal agencies' proposed energy conservation budgets for FY 1983 compare with FY 1982. Comparative figures are difficult to assemble inasmuch as there is no one single way that such expenditures are reflected in the budgets of the various Departments and agencies. However, I will submit for the record a table which gives some indication of what the major energy-using agencies have reported as planned energy conservation expenditures.

Question: Could you provide the Committee for the record the dollar amount for Federal conservation projects for both Fiscal Year 1982 and 1983 for DOE and other agencies?

Answer: As referenced in the previous answer, I will submit for the record a breakdown of FY 1982 appropriations and FY 1983 budget requests for energy conservation activities by eight major energy-using agencies.

## FEDERAL ENERGY MANAGEMENT PROGRAM

|  | 1982 Appropriation (In $000) | 1983 President's Request (In $000) |
|---|---|---|
| **Department of Agriculture** |  |  |
| - Forest Service | 385 | 0 |
| - Agricultural Research Service | 2,500 | 2,588 |
| - Animal & Plant Health Service | 160 | 250 |
| **Department of Defense** |  |  |
| o Energy Conservation Investment |  |  |
| - Army | 64,265 | 19,990 |
| - Navy | 49,768 | 30,240 |
| - Air Force | 48,057 | 59,420 |
| - Family Housing | 44,878 | 68,374 |
| - Guard, Reserve & Defense Logistics Agency | 10,620 | 3,360 |
| o Solar Energy Application |  |  |
| - Army | 4,375 | 2,232 |
| - Navy | 830 | 2,208 |
| - Air Force | 1,908 | 3,900 |
| **Department of Energy** |  |  |
| - In-House Energy Management | 23,600 | 10,000 (1) |
| **General Services Administration** |  |  |
| - Repairs and alterations | 33,000 | 21,000 |
| **Department of the Interior** |  |  |
| - Various accounts | 19,000* | 19,000* |
| **National Aeronautics & Space Administration** |  |  |
| - Construction of Facilities | 5,245 | 6,580 |
| **Dept. of Transportation** |  |  |
| o Coast Guard |  |  |
| - R&D (miscellaneous including Solar) | 0 | 350 |
| - Acquisition, construction & improvements | 43 | 2,450 |
| o Fed. Aviation Adm. |  |  |
| - Facilities & Equipment | 65,100 | 112,300 (2) |
| - Metro Washington Airports (various energy-savings projects at Dulles) | 50 | 430 |

1 Submitted under Dept. of Commerce budget for Energy Research and Technology Administration.

2 Includes funds for on-going projects to replace vacuum-tube equipment with solid state technology and replacement of FAA fleet with more fuel efficient aircraft.

| | 1982<br>Appropriation<br>(In $000) | 1983<br>President's Request<br>(In $000) |
|---|---|---|
| **Veterans Administration** | | |
| - Major projects (construction) | 6,000 | 4,002* |
| - Minor projects (construction) | 725 | 1,000* |
| - Medical care (non-recurring maintenance & repair | 28,240 | 8,500* |

* Estimated

## District Heating and Cooling

Question: To how many cities have you made grants to assess the potential of district heating? What is the nature of the help you have provided?

Answer: In 1981, in cooperation with the Department of Housing and Urban Development, 28 cities received grants (about $50,000 each) to study the feasibility of district heating and cooling. These cities also received limited technical assistance from Argonne and Oak Ridge National Laboratories.

In 1978, nine utility/city Phase I contracts were awarded for assessing the potential of district heating and cooling in connection with cogeneration by an electric power plant. For the seven utility/city Phase I contracts where the project was feasible, a Phase II contract was awarded to establish the institutional arrangements and framework required to bring the project to demonstration. The Phase I contracts were for $55,000 - $300,000 per utility/city. The Phase II studies were cost-shared with the U.S. Government's share being about $500,000 per utility/city.

Question: When do you expect to have some results from these tests?

Answer: The 28 HUD/DOE feasibility studies will be completed in the summer/fall of 1982. The results should be available in October 1982. The Phase I utility/city studies are completed. The Phase II results are scheduled for completion in 1982.

Question: Will the results of the assessments be applicable to other cities? If so, how will you disseminate the information?

Answer: The results from the studies would be applicable to many other cities and would significantly reduce the costs and increase the reliability of their own feasibility studies.

For the 28 HUD/DOE feasibility studies, the contract calls for each city to be available to consult with other cities for one year. There are no other plans for dissemination of this information to cities. For the DOE utility/city studies, final contract reports will be prepared and given limited distribution. Information dissemination and technical assistance from Argonne and Oak Ridge National Laboratories will continue until the end of FY 1982.

Question: What remains to be done to establish district heating systems?

Answer: The most important thing is for some of the 28 HUD/DOE cities to go from the feasibility studies to establishing the institutional arrangements and completing the reference design for the system so they can raise the funds necessary to construct the system.

## FEDERAL AND COMMUNITY PROGRAMS

| KEY ACTIVITY | PROJECT TITLE | FY 1981 ACTIVITY | ESTIMATED ACTIVITY FY 1982 (ADMIN. BUDGET) | ESTIMATED ACTIVITY FY 1982 (CONG. BUDGET) | PLANNED ACTIVITY FY 1983 |
|---|---|---|---|---|---|
| Federal Energy Management Program (FEMP) | | | | | |
| Objective: Coordinate energy conservation planning and monitor energy use in Federal agencies and prepare mandated reports. | Federal Planning | Coordinate development of energy plans from all Federal agencies; assemble quarterly and annual reports | Same | Same | None |
| | Program Technical Guidance | Provide information and technical support to all Federal agencies in preparing plans, establishing targets and measuring progress in energy savings; update life-cycle cost guidelines. | Same | Same | Monitor contract closeout (carry-over funds). |
| | Program Performance & Liaison | Evaluate and approve agency plans and progress; maintain data information system. | Same | Same | None |
| | Federal Reporting | Prepare E.O. 12003/NECPA report (Federal Govt. Energy Management). Prepare ECPA report (Federal Energy Conservation Program). Prepare Federal Energy Management Master Plan. | Update each of these reports. | Same | Monitor contract closeout (carry-over funds). |
| FEDERAL ENERGY PROGRAMS: TOTAL | | $530,000 | $1,000,000 | $500,000 | $ 0 |

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## Energy Tax Credit

When the energy tax credit was established, the Treasury Department was to consult with DOE.

Question: What has your economic and engineering analysis of the tax credit shown?

Answer: Sixteen tax credit applications were received from the Treasury Department for engineering and economic evaluations. Of the 16 applications, 13 were recommended to the Internal Revenue Service for approval for tax credit and three were not. In general, he engineering and economic analyses conducted were in agreement that the items submitted were legitimate conservation devices and should be considered by the IRS for tax credit. A list of the 16 applications is attached for your review.

Question: Can you provide for the record any detailed analysis you have made about the tax credit?

Answer: Yes, I will submit for the record a copy of the engineering and economic analysis of applications #12 and #14, which were recommended to the IRS for approval, and a copy of the analysis for #13 which was not recommended for approval. We have similar records of all 16 applications received to date.

Question: Is the tax credit being used as much now as when first implemented?

Answer: This question should be directed to the IRS for any detailed record of the extent to which tax credit measures have been used.

U.S. DEPARTMENT OF ENERGY

# memorandum

DATE January 6, 1982

REPLY TO ATTN OF John Millhone, Director, BERD

SUBJECT Tax Credit Responsibility

TO BERD Division Directors

Reference is made to my memorandum of August 31, 1981 (copy attached), regarding the DOE responsibility in the review and analysis of applications to the Treasury Department's Federal Energy Tax Credit List. The recent personnel reassignments resulting from the Reduction-in-Force (RIF) and other shifts has caused new assignments for many of this Office's personnel; in the past four months the program responsibility for tax credit analysis has rested with four individual managers. This instability has caused a delay in assignments in reviewing and analyzing the Treasury Tax Credit applications.

As outlined in subject memorandum, the tax credits are viewed as the primary Federal incentive to effect near term conservation and our participation in the review process is important.

Effective January 1, 1982, responsibility for BERD Tax Credit duties is reassigned to Ernie Freeman, who reports to the Director of the Building Services Division, through the Branch Chief, Applications Research and Development Branch. Ernie's responsibilities and support will remain the same as spelled out in my August 31, 1981, memo.

Please provide your Branch Chiefs copies of the attached old and new schedules for completing the engineering criteria review and analysis in a timely fashion. Note items 6 through 16 which are still incomplete.

Ernie will contact the appropriate Branch Chief's to meet with individuals responsible for reviews and analysis.

Attachments

cc: Geraldine Garardi
Susan Heard
Ernie Freeman
George Chaconas
Steve Cavros

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U.S. DEPARTMENT OF ENERGY

# memorandum

M. Friedrichs

**DATE** August 31, 1981

**REPLY TO ATTN OF** John Millhone JHollhone

**SUBJECT** Tax Credit Responsibility

**TO** BERD Division Directors

The Energy Tax Act of 1978 requires the Treasury Department to consult with DOE in the review and analysis of applications for addition of energy efficient items to the Federal Energy Tax Credit List. While Treasury has primary responsibility to determine whether specific items are added to the lists, DOE provides the expertise to analyze the technical aspects of items as well as the necessary assessment of how these items actually affect energy efficiency. Because tax credits are now viewed as the primary Federal incentive to effect near term conservation, DOE's participation in the review process is of paramount importance.

Responsibility for carrying out BERD tax credit duties has been assigned to Gene DeLaTorre, who reports directly to the Director of the Building Services Division. Peter Holihan will be assisting Gene in these efforts. Gene's responsibilities include:

(1) Providing assistance to the Deputy Assistant Secretary for Conservation and myself in the monitoring and analysis of legislative initiatives and Federal regulations involving tax or other financial incentives for building conservation.

(2) Liaison with DOE Offices of General Counsel and Policy, Planning Analysis; CE's, Policy, Planning and Evaluation, Solar Heat Technologies and Industrial Programs; and Treasury regarding tax credit issues;

(3) Overseeing development and implementation of DOE's technical and economic review of applications;

(4) Overseeing development of DOE's final recommendations based on review findings for each application;

(5) Overseeing development of computer models by Oak Ridge National Laboratory to: 1) analyze whether applications meet Treasury criteria for addition to approved measures lists; and 2) assess market penetration for technologies with and without Federal Energy Investment Tax Credits; and

(6) Monitoring use and impact of tax credits on the nation's economy, which includes maintaining contact with key private sector entities and other Federal agencies.

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Peter Holihan will be primarily responsible for conducting and/or coordinating the review of manufacturer applications, with the assistance of other BERD and CE offices. He will be also assisting Gene in other related areas.

In order for Gene and Peter to carry out their responsibilities, support will be provided from the following areas within BERD: Building Systems and Equipment Divisions, and staff economists and analysts. Engineers and economists assigned to review applications will work directly with Peter and Gene during the review process and will be responsible for timely completion of their reviews. Assistance also will be available from the CE Solar and Industrial offices, as required.

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## Industrial Energy Conservation

Question: There is clear evidence that the Nation's industrial sector is making progress in conserving energy.

-- Do you have any information on how much of the improvement is because of capital investments in new types of energy technology versus how much is based on improvements in maintenance techniques and minor adjustments to processes and technology?

Answer: A variety of analyses have been undertaken to identify and explain the factors which have contributed to energy conservation in the U.S. These analyses, however, have only developed conclusions about the relative contributions of: (1) structural changes in economic production and (2) more efficient use of the energy resource. Recently completed studies have generally concluded that less than 50% of reduction in 1980 industrial energy consumption, relative to 1972, can be attributed to efficiency improvement. Estimates range, however, from 25% to more than 75%.

DOE is not aware of any quantitative industry-wide analyses which distinguish between the industrial energy efficiency improvement due to capital investment and that due to "housekeeping" measures. Based on energy efficiency improvement reports received from industry, it is qualitatively estimated that more than two-thirds of the efficiency improvement since 1972 is attributable to tightening up of operations, better maintenance procedures and other actions not requiring significant capital investment.

Question: What indications do you have from industry that they will indeed increase their R&D spending to compensate for the loss of government research funds in industrial programs?

Answer: The economic recovery program has not been in place long enough to determine the increase in private industry research activitiy. With higher energy prices during the years ahead, and the Federal Government's increased tax incentives for RD&D investment, it is expected that investment in reduced energy consumption will offset the reduction in Federal Government resources devoted to energy conservation wherever economical.

Question: The budget does not describe the FY 1982 industrial program.

-- Can you please give us an overview of the projects you are undertaking in FY 1982?

-- Through what stage of development will you take the project in FY 1982?

Answer: The projects to be undertaken in FY 1982 represent continuation of ongoing high priority activities and selected new starts of high risk R&D that industry would not be likely to undertake on its own. The attached sheets show the activities and the specific actions during FY 1982, thereby answering both parts of the question.

Question: One barrier to industry undertaking some research efforts is the fact that no one firm stands to benefit enough to undertake the expenditure. As a result, something society might find valuable may be left undone. In your view, is this a barrier to an industrial firm undertaking a research program?

Answer: Research and development activities conducted by a company are directed toward benefits to be gained either in the near or long term future of the company. These activities are undertaken to put them in a better market position than their competitors. This improved position can be in improved or new products or cost of manufacture which gives them an edge on profitability. If the technology development does not offer such an improved position, it may not be undertaken.

Question: How much of the R&D conducted in the industrial area fits into the so-called generic type of research rather than process or industry-specific research?

Answer: The generic technologies to which we refer, such as cogeneration, improved combustion efficiency, heat pumps, etc., are only generic as they apply to end using industries. The developers of these technologies are the companies that sell the equipment to the end users, thus, to them, it is industry-specific research.

Question: Which industries are in the best position from a technical and financial point of view to conduct a research program?

Answer: Industries which are generally in the best position from a technical and financial point of view to conduct a research program are the large integrated industries such as petroleum refining, chemicals, pulp and paper, and primary metals.

Question: Which industries are in the worst shape?

Answer: Generally, the smaller fragmented industries are those which are least able to undertake large R&D programs. Except for a few specific companies, these industries are textiles, fabricated metal products, food processing, and agriculture.

Question: What portion of the industrial projects contain provisions which result in a repayment to the government when successful?

— How much has been returned to the Treasury under these provisions?

Answer: Some projects involving larger companies as host sites for commercial demonstrations have involved buy-back provisions after successful demonstration of the technology. To date only one project, with Roll Coater, has actually completed the buy-back provision of the contract, returning $218,000 to the treasury. Several other projects which are still in the fabrication or installation phase also have various repayment provisions, but monies will not be returned to the treasury until the demonstration testing or future technology sales are completed. Examples of these other projects are:

| Project | Demonstration Contractor | Expected Buy-Back Amount |
|---|---|---|
| Plating Waste Concentrator | Li-Con | $ 35,000 |
| Cold Corrugation | Union Camp | 350,000 |
| Organic Rankine Cycle Bottoming | Sundstrand | 3,000,000 |
| Hi COP Heat Pump | Mechanical Technology Inc. | Provision in negotiation |
| Brayton Solvent Recovery | Garrett AiResearch | " " " |
| In-Forest Dried Residue Fuel | Gorham International | 75,000 |
| Electric Rankine Heat Pump | Westinghouse | Provision in negotiation |

Question: How much of the multi-sector request will be for industrial conservation related programs?

-- How do the industrial projects that are to be continued in the multi-sector program compare to the projects that have been undertaken earlier?

Answer: A total of $998,000 for industrial conservation is contained in the multi-sector program request for FY 1983. This would be used to conduct design studies of Stirling Cycle Heat Pumps for intermediate temperature process applications and to undertake exploratory research activities on chemical and magnetic heat pump concepts. The objective of these efforts is to expand the technical range of applicability and reduce the intrinsic cost of heat pump systems.

The industrial projects to be continued in the multi-sector program (described above) differ from those undertaken earlier in that they are directed more toward long range, high risk, generic R&D.

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## ENERGY TAX CREDIT APPLICATIONS

| NO. | ORIGINATOR | TECHNOLOGY | DATE REC IN BERD | TECHNICAL REVIEW | ECONOMIC REVIEW | OLD PROJECTED COMPLETION | NEW PROJECTED COMPLETION | STATUS 1/4/82 | ASSIGNED TO | TO EPPA |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Hydrotherm Inc.<br>Rockland Avenue<br>Northvale, NJ 07647 | Hydrotherm High Efficiency Furnace | 4/21/81 | 10/9 | 10/15 | 11/1 | | Completed | BED<br>Ryan | Completed |
| 2. | Donald C. McKillop, Sr.<br>244-2 Suburban Route<br>Rapid City, SD 57701 | McKillop-Heat Exchanger Chimney | 4/21/81 | 10/9 | 10/15 | 11/1 | | Completed | BED<br>Ryan | Completed |
| 3. | Witten Automatic Vent Company<br>P. O. Box 2244<br>Gastoaie, NC 28052 | Witten-Thermatic Vent (Crawl Space Vent) | 4/21/81 | 10/9 | 10/15 | 11/1 | | Completed | BSD<br>Ross | Completed |
| 4. | Temp Vent<br>Box 2030<br>Shelby, NC 28150 | Temp Vent-Auto Foundation Ventilator (crawl-space) | 4/21/81 | 10/9 | 10/15 | 11/1 | | Completed | BSD<br>Ross | Completed |
| 5. | Sween and Salazer LTD<br>(fn SJC Corp)<br>Brenwood Business Center<br>5620 Smetana Drive<br>Suite 100<br>Minnetonka, Minn 55343 | Recuperative Furnace SJC Corp. | 4/24/81 | 10/26 | 11/2 | 11/15 | | Completed | BED | 1/11/82 |
| 6. | Keck, Mahin and Cate<br>8300 Sears Tower<br>233 S. Wacker Drive<br>Chicago, IL 60606 | Water Sofner-Water Quality Association | 5/27/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Gutmann | COMPLETED<br>2/16/82 |
| 7. | Groom and Nordberg<br>(For Fedders Corp)<br>Suite 450<br>1775 Pennsylvania Ave,NW<br>Washington, DC 20006 | Fedders Heat Pump Water Heater | 4/24/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Gutmann | |
| 8. | Energy Saving Devices<br>27 Wilbur Street<br>Lynbrock, NY 11563 | Energy Saving Devices Copper Finned Tube Heat Exchange for Gas/Oil System | 5/27/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Lim | 10 days, |

| NO. | ORIGINATOR | TECHNOLOGY | DATE REC IN BERD | TECHNICAL REVIEW | ECONOMIC REVIEW | OLD PROJECTED COMPLETION | NEW PROJECTED COMPLETION | STATUS 1/4/82 | ASSIGNED TO | TO EPPA |
|---|---|---|---|---|---|---|---|---|---|---|
| 9. | Saxon Industries<br>1230 Avenue of the Americas<br>New York, NY 10020 | Saxon Industries Window Insulating Film | 6/2/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BSD<br>Boulin | |
| 10. | Energy Engineering & Research Corp.<br>14915 N. Nebraska Ave.<br>Tampa, FL 33612 | Energy Engineering & Research Corp. Air Conditioner Cooler | 6/2/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | | BED<br>~~Dudley~~ Gutmann | |
| 11. | Bacchus Ind. Inc.<br>P. O. Box 455<br>Sunlevel Park,<br>New Mexico 88063 | AIREZE Evaporation Cooler | 8/31/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | | BED<br>Gutmann | |
| 12. | American Stablis Inc.<br>Industrial Park<br>Lewiston, Maine 04240 | Solid State Boiler Temperature Automatic Control | 8/31/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Gutmann | X |
| 13. | Howell Law Corp. (for Energy Savers Co.)<br>9848 Business Park Drive<br>Suite G, Sacramento | Air Conditioning Energy Saver | 8/31/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>~~Dudley~~ Gutmann | |
| 14. | Surgeonics Limited<br>155 Kisco Avenue<br>Mount Kisco, NY 10547 | Micro Processor Boiler Control System | 8/31/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Gutmann | X |
| 15. | Tassokeoler Hjallesegrade<br>45 5260<br>Hjallese, Denmark | Boiler, Multi Fuel, Solid Fuel and Oil Fired | 8/31/81 | 10/26 | 11/2 | 11/15 | 2/8/82 | Pending T&E Review | BED<br>Lim | 10 days, |
| 16. | Intermatic Incorporated<br>Intermatic Plaza<br>Spring Grove, IL 60001 | Hot Water Heater Automatic Temperature Control | 8/31/81 | 10/26 | 11/2 | 11/15 | 8/8/82 | Pending T&E Review | BED<br>Gutmann | |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Combustion Efficiency Improvement**<br>Objective: To increase overall efficiency of combustion through increased flame temperature decreased excess air and higher combustion air preheat. | Burner-Ducting Recuperator | Award (2) contracts for proof of principle testing of concept - metal soaking pits and remelt furnaces. Start engineering designs. | Complete designs and start engineering hardward fabrication. Initiate an analysis of the burner duct recuperator control dynamics. Provide for INEL takeover of complete project activity. |
| | Air-Fuel Ratio Control | Continue laboratory testing of multiple burner excess air control unit. | Complete testing of unit. Conduct analysis of the test results and issue a final report. Initiate analysis of stratified exhaust theory. |
| | Oxygen Enrichment of Combustion Air | Fabricate engineering prototype unit for field testing of concept on an annealing furnace. Utilize oxygen for combustion air and nitrogen for inert atmosphere. | Issue report on results. Conduct theoretical investigation on oxygen enrichment. Develop fabrication techniques for producing thin membranes (2000°A). |
| Objective: Develop coal-fired equipment that will retrofit existing oil-fired boilers without baghouses. | Slagging Coal Burner (Medium and Small Industrial) | None | Participate with Fossil Energy on development of novel burners for industrial size boilers. Conduct theoretical investigation on coals and burner designs. Conduct study on fuel preparation. Conduct studies on environmental aspects. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Advanced Recuperators**<br>Objective: To develop high temperature, high effectiveness heat exchangers that operate in various environments and can be produced at relatively low cost. | Fluidized Bed Waste Heat Recuperators | Award (2) contracts for proof of principle - boiler applications. Start engineering designs designs. | Complete designs and start engineering hardware fabrication Provide for INEL takeover of complete program activity. |
| | High Effectiveness Recuperators (Technical Acceleration) | Continue to fabricate balance of heat exchangers, perform installation in field test sites. | Complete fabrication and conduct field testing. Obtain test data. |
| | High Temperature Ceramic Recuperators (Technical Acceleration) | Continue to fabricate balance of heat exchangers, start installation in field test sites. Start obtaining test data. | Complete fabrication and field testing. |
| | Large Passage Ceramic Recuperators | None | Complete heat exchanger materials testing and conceptual development of passage configurations. |
| Objective: To evaluate opportunities for low temperature, low cost, high effectiveness heat exchangers that can operate in various, dirty industrial exhaust streams | Recovery of Waste Heat from Textile Type Dryers | Complete development of engineering concept. Issue Phase I report. | Field measurement of exchanger effectiveness and testing of selected sensors. Issue Phase II engineering report. |

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# WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **High Temperature Heat Pumps**<br>Objective: To upgrade waste heat to produce process steam. | Electric Rankine | Complete system design. | Start hardware fabrication of engineering test unit. Provide for DOE laboratory takeover of project. |
| | Brayton Solvent Recovery . | Complete system design. | Start fabrication of engineering test model. Provide for DOE laboratory takeover of project. |
| | High C.O.P. Heat Pump | Complete system design. | Start fabrication of engineering test unit. Provide for DOE laboratory takeover of project. |
| | Stirling Heat Pump | None. | Initiate engineering study of performance characteristics and logical applications. |
| | Chemical and Magnetic | None. | Initiate studies in new heat pump concepts (chemical magnetic). Establish goals and specifications for new high temperature heat pump working fluids and initiate laboratory development and testing of fluids. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Waste Products Utilization | Remanufacturing of Parts/ Assemblies | Complete an engineering/ economic analysis study of additional applications for rebuilt manufactured products. | Complete the final report. |
| Objective: To utilize industrial waste materials (gases, liquids, and solids) as feedstocks, fuels or other usable forms. | Atactic Polypropylene to Fuel Oil | Initiate first field development testing of atactic polypropylene conversion to fuel oil. | Complete the final report. |
| | Atactic Polypropylene (ATPP) Development | None | Extend first development to more intractable ATPP feeds containing contaminants with related field tests. |
| | In-Forest Dried Residue Fuel | Initiate design study for complete system of gathering, drying distribution of forest residues as fuels. | Design and fabricate a test drier for field engineering tests. Provide for project transfer to DOE laboratory (INEL). |
| | Plating Wastes Concentration | Start engineering testing of recycling system for cyanide plating wastes. | Complete engineering field tests and issue final report. |
| | Liquid Fuels from Wastes | Operate laboratory unit to determine reasons for low liquid fuel output and possible new catalysts. | Continue laboratory development of catalysts to increase liquid fuel output from 10 gal. per ton waste to 50 gal. per ton. Start design of pilot unit to evaluate process problems associated with larger scale processing. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Waste Products Utilization (Continued) | Waste Tire Conversion | Fabricate and install prototype equipment for industrial testing. Start tests on travelling grate. | Complete development project using chopped waste tires as a fuel in fluidized bed boilers and as an auxiliary fuel with coal in small industrial boilers Issue more complete report on testing on travelling grate and fluidized bed. |
| | Carbon Wastes to Fuels | None | Conduct baseline study on feasibility of converting liquid hydrocarbon wastes to fuels and chemicals. |
| | Fuel from Chemical Waste Pyrolysis | None | Conduct laboratory studies on selected problematic chemical wastes. Characterizie reaction conditions and product gases. Outline mini plant test facility. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Program Analysis and Support | Program Analysis and Support | Decentralized project management and support continued at Idaho Operations Office and Idaho National Engineering Laboratory. | Decentralized project management and support continued at Idaho Operations Office and Idaho National Engineering Laboratory. |
| | | Annual review and assessment of programs by National Academy of Sciences. | Annual review and assessment by National Academy of Sciences. |
| | | Program support by Argonne National Laboratory and Pacific Northwest Laboratory. | Program support by Argonne National Laboratory and Pacific Northwest Laboratory. |
| | | Support contractors for technical analysis and studies. | Support contractors for technical analysis and studies. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Advanced Bottoming Cycle Systems | ORC Units | Fabricate one unit, initiate installation design of first unit. | Install first unit, initiate installation design of three units. Provide for INEL takeover of project activity. |
| Objective: Develop and test cogeneration systems that operate on thermal process waste energy. | ORC Generic Development Working Fluid | Engineering studies. | Laboratory testing of working fluid. Provide for INEL takeover of project activity. |
| | Environmental Assessment | None | Prepare assessments. |
| | Bi-Phase Concentration | None | Operate half scale unit to obtain test data. Initiate design & testing of trial bi-phase nozzles for use in engineering prototype unit. Provide for INEL takeover of project. |
| | Brayton Sub-Atmospheric System | None | Prepare a use conditions report for Brayton Bottoming Systems and initiate a systems design for a laboratory unit. Provide for INEL takeover of project. |
| | Advanced Multi-Application ORC Systems | None | Initiate component development. Initiate a design for a reliability test unit. Build and test selected components. Provide for INEL takeover of project. |

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## WASTE ENERGY REDUCTION

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Advanced Topping Cycle Systems | Low Speed Diesel Chemical Plant | Complete design, continue fabrication. | Complete fabrication and installation. Start testing. Provide for INEL takeover of project activity. |
| Objective: Develop and test high electrical output of domestic fuel fired fired cogeneration systems. | High Back Pressure Steam Turbine - Textile Plant | Complete fabrication. | Initiate testing. Provide for takeover of project by INEL. |
| | Coal-Water Slurry Diesel (Steam Diesel) | None | Initiate thermodynamic analysis and fuel conditioning studies for a coal/water slurry fired diesel engine. Run single cylinder engine and analyze test data. Provide for Chicago OPS/ANL takeover. |
| | Coal-Fired Brayton | None | Start engineering evaluation of Air Heater and Turbine Systems. Provide for project takeover by Chicago OPS office/ANL. |
| | Waste-Fired Brayton | None | Initiate a preliminary analysis of a waste direct fired Brayton Cycle System. Provide for Chicag OPS/ANL takeover. |
| | Thermionic Burner | None | Conduct design study on using a thermionic burner in a topping cogeneration system. Provide for Chicago OPS/ANL takeover. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Advanced Electrode Material R&D** | Improved Cathodes | Test small titanium diboride cathodes to solve lifetime problems; design 40,000 ampere cell. | Construct and start 40,000 ampere cell and perform tests. Review with Bonneville for funding. |
| Objective; To save electricity by developing more efficient electrode systems for plants using electricity to produce metals such as aluminum, magnesium and titanium. | Improved Anodes | Research to develop satisfactory anode materials for Hall cells, and testing electrical connections to these anodes. | Development and testing of anodes made from new anode materials in small, bench-type Hall cells. Review with Bonneville for possible completion. |
|  | Current Efficiency Improvement | None | Construction of electrolytic cell & equipment to study sources of current inefficiency in production of metals from chloride baths. |
|  | Aluminum Direct Reduction | Completion of tests on hybrid system. Completion of heat and mass balances. | Submission of final report. |
|  | Magnesium Reduction Technology Study | Complete. |  |
|  | Lead Reduction Technology Study | Complete. |  |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **High Temperature Sensing** | High Temperature Remote Inspection Technology Assessment | Install sensor system. Start tests on continuously cast slabs. | Complete cast slab tests on top side only. Complete tests on rolled slabs on top and bottom sides. Prepare design, analysis and final report. |
| Objective: High temperature sensing and dynamic modelling to enable utilization of sensible heat in high temperature processing of metals. | Sheath for High Temperature Sensor | Outline specific work to be accomplished with program. | Contract with Watertown Lab-Army. Identify possible materials. |
| | Direct Measurement of Thermal State of Solids | Outline program. Start work on scoping the project. | Receive PNL and AISI inputs. Scope the project. Contract with University or not-for-profit lab. Design system based on state-of-the-art review of methods. Commence project. |
| | Hierachical Computer Control System | Mathematical system development for steel plant energy control. | Start work on energy control system for aluminum. Continue development of steel plant energy control models. Deliver math models to steel industry for coke oven, blast furnace, soaking pits, reheat furnaces and power distribution network. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Advanced Grinding and Classification Systems** | Particle Size Control | Initiate procurement for development of particle size control technology. | Start development of particle control technology. Initiate testing of particle size control cement. |
| Objective: Examination of blasting, fragmentation physics, comminution with both modelling and simulation, to reduce huge energy losses now occurring. | Ore Cutting Research | Initiate contracting activity. | Acquisitions of equipment. Development of water-jet assisted cutting tool system using sound recording for fracture studies. |
| | Comminution SCAPS | Definition of program. | Review and contract for laboratory R&D. |
| **Melting of Metals** | Stack Air Injection to Cupola | Air injection system tested on small-medium cupola. Environmental study conducted on one completed system. | Test a large size cupola of about 100-inches diameter. |
| Objective: To reduce the large quantity of oil, gas and electric power used in the melting of recycled scrap. | Dry Cooling of Coke | Design and start construction of a pilot plant to test cooling procedure in steel chambers. | Install test equipment at a coke oven and measure heat recovery. |
| | Metal Particle Melting Process | Prepare laboratory materials for melting in slags to determine heating rates. | Continue lab tests and conduct more melting tests. Analyze results using dimensionless ratios to improve application to commercial furnaces. |
| | Electric Arc Furnace | Compare predicted and actual temperatures in electric arc furnace operation for model verification. | Use model to explain low energy operating parameters. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| | Slagging Coal Gasifier (ALCOA) (Large Industrial Metals Melting) | Carry out desulfurizing test. | Continue testing and establish design parameters. Issue a report on results of project to date. |
| **Energy Integrated Farm Systems**<br>Objective: To develop on-farm integrated livestock-crop energy production systems that are economic, reliable, require minimum attention and maintenance, minimize the need for energy and material flow across the farm system boundary and are cost-shared by private sector. | 1. Arizona Cotton & Alfalfa Farm | Complete research into technologies and conservation practices to be implemented. Complete system design and analysis of all eight projects. Issue report on this phase of each project. | Complete construction and installation of equipment on each farm. Commence operation and monitoring of all activities. |
| | 2. Georgia Dairy Farm | | |
| | 3. Nebraska Dairy Farm | | |
| | 4. New York Dairy Farm | | Retain overall responsibility and cognizance over project. |
| | 5. Puerto Rico Poultry Farm | | |
| | 6. North Dakota Dairy Farm | | |
| | 7. Texas Hog Farm | | |
| | 8. Virginia Dairy Farm | | |

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| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Advanced Catalytic Reactor**<br>Objective: To increase the efficiency of chemical processes by developing the concept of a combined reaction/separation process. | Advanced Catalytic Reactor | Continue laboratory research on the applicability of the process to various chemical reactions, with particular emphasis on octane boosters. Build and demonstrate the applicability of the reactor for MTBE. | Complete the laboratory research and MTBE demonstration. Issue a final report on MTBE. In addition, initiate procurement for expended research into the parameters of the reaction process and begin research on applicability to other materials. |
| **Hyperfiltration Systems**<br>Objective: To develop liquid/liquid and liquid/solid separation and concentration systems more effective than current technology. | Improved Hyperfiltration of Process Sugar | Development and testing of membranes for concentrating and recovery of components in sugar processing. | Continue membrane and module development for concentration of sugar processing streams. |
| | Wastewater and Food Hyperfiltration | Limited feasibility study of the application of hyperfiltration in the food industry. Issue report. | Complete feasibility study of the application of hyperfiltration in the food industry. Institute test of membranes and modules at selected sites. Establish contacts in FDA. |
| | Closed Loop Industrial Hyperfiltration textiles. | Testing; equipment monitoring. | Continue testing. Issue final report. In addition, modify process equipment. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Advanced Sensors and Computer Control Systems**<br>Objective: To develop sensing devices that will permit accurate control of process steps and computer control of processes. | Automatic Energy Control System Development | Begin engineering study of the paper process to develop complete computer process control (Phase I). | Complete Phase I effort and issue report. In addition, begin work to conduct Phase II, engineering tests of prototype control equipment. |
| | Sensor Development and Support Project | Organize a meeting representing Pulp and Paper Industry, equipment and control instrument manufacturers. | |
| | Advanced Sensor Development | Survey of sensor systems and issue interim report. A selection of process control problems requiring sensor development made. | Laboratory research on the design, development, and testing of sensor devices applicable to the identified process control problems will be conducted. In addition, extend development and testing of sensors. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Freeze Concentration | Freeze Crystallization | Continue development of freezing technology to concentrate the solids in black liquor prior to burning the black liquor to recover process chemicals. | Continue development activities. Test the system developed to determine operating parameters and issue final report. In addition, improve the freeze concentration system for black liquor. Initiate research on the technology for concentrating food products. |
| Low Temperature Coatings<br>Objective: To reduce the energy required to apply coatings and dyes to surfaces (metal, plastic, textile, paper, etc.) | Radiation Curable Coatings | Conduct research on techniques for curing paint coatings on metal surfaces, using ultra violet radiation to determine the curing mechanisms. | Issue final report. |
| | Foam Finishing Development | Complete laboratory research on foam dyeing of textiles, and conduct plant trials. | Issue final report. |
| | Foam Finishing Development Acceleration | Install equipment and test technology in four different textile product lines in industrial plants. | Complete tests and issue final report. |
| | Cold Adhesive Development | Install adhesive system on cold corrugating system for producing corrugated box board in industrial plant. | Complete demonstration of cold corrugation in box board line. Issue final report. In addition, initiate research on application of cold adhesives technology to other bonding problems. |

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## EPA Mileage Guides

Question: What is the status of the EPA mileage guides? Do you intend to pay for printing in FY 1983? If so, how much?

Answer: The First Edition of the 1982 Model Year Gas Mileage Guide was printed in September 1981 with 7.6 million copies made available to car dealers and the public. In the interest of saving costs and because of the continued availability of copies of the First Edition, the publication of the second Edition of the 1982 Model Year Guide was cancelled. Data developed may be printed in the Federal Register so that interested organizations may disseminate the information as they wish. Sufficient funds are available from FY 1982 to support the printing of the September 1982 edition of the 1983 Model Year Guide. The anticipated cost for the 1983 Model Year Guide is approximately $500,000.

## Funding of State Energy Offices

Question: On the average, what percentage of their State energy offices do States fund in comparison to Federal Government grants?

Answer: DOE informally surveyed the State energy offices in March 1982. The results of that survey are provided in the attached table. In general, most State energy offices receive most of their funds from the Federal Government.

Question: What specific expertise that is valuable to the Federal Government will be lost if the States neglect to provide additional funding for State energy activities?

Answer: The State energy office have developed staffs of personnel who are experienced and knowledgeable in energy supply and demand patterns, energy distribution systems, energy management, and programs that increase energy efficiency within the State. Further, most State energy offices have developed experience and expertise concerning the relationships between energy use and the various codes and regulations governing buildings, taxes, land use, etc. It is expected that States will maintain this expertise to the maximum extent possible and in keeping with State-established priorities.

Table

| State | Share of State Energy Budget (%) Federal | State |
|---|---|---|
| Alabama | 88 | 12 |
| Alaska | 26 | 74 |
| Arizona | 77 | 23 |
| Arkansas | 70 | 30 |
| California | 35 | 65 |
| Colorado | 100 | 0 |
| Connecticut | 50 | 50 |
| Delaware | 100 | 0 |
| District of Co. | 99 | 1 |
| Florida | 80 | 20 |
| Georgia | 95 | 5 |
| Hawaii | 85 | 15 |
| Idaho | 100 | 0 |
| Illinois | 86 | 14 |
| Indiana | 77 | 23 |
| Iowa | 99 | 1 |
| Kansas | 80 | 20 |
| Kentucky | 10 | 90 |
| Louisiana | 75 | 25 |
| Maine | 80 | 20 |
| Maryland | 77 | 23 |
| Massachusetts | 68 | 32 |
| Michigan | 35 | 65 |
| Minnesota | 46 | 54 |
| Mississippi | 55 | 45 |
| Missouri | 99 | 1 |
| Montana | 66 | 34 |
| Nebraska | 76 | 24 |
| Nevada | 90 | 10 |
| New Hampshire | 55 | 45 |
| New Jersey | 65 | 35 |
| New Mexico | 58 | 42 |
| New York | 40 | 60 |
| North Carolina | 90 | 10 |
| North Dakota | 95 | 5 |
| Ohio | 60 | 40 |
| Oklahoma | 100 | 0 |
| Oregon | 30 | 70 |
| Pennsylvania | 60 | 40 |
| Rhode Island | 94 | 6 |
| South Carolina | 90 | 10 |
| South Dakota | 90 | 10 |
| Tennessee | 60 | 40 |
| Texas | 35 | 65 |
| Utah | 85 | 15 |
| Vermont | 75 | 25 |
| Virginia | 80 | 20 |
| Washington | 60 | 20* |
| West Virginia | 90 | 10 |
| Wisconsin | 75 | 25 |
| Wyoming | 99 | 1 |

*20% comes from Bonneville Power Administration

Source of data: Telephone survey of State Energy Offices, March 8 and March 9, 1982.

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Question: What kind of evaluations have you done in order to ascertain whether the State grant programs actually contribute to saving energy?

Answer: A study of the effectiveness of the State Energy Conservation program (SECP) in 1980 was made using evaluation approaches that permit estimation of energy savings attributable to selected program activities, rather than to price or other factors. A rigorous evaluation of the Energy Extension Service two-year, ten-State pilot effort was conducted to gather similar information about the EES program. Evaluations of the national EES program and of the 1981 State Energy Conservation program are in progress. Results are expected mid-1982.

Question: What results do these evaluations show?

Answer: Evaluations completed show that these programs have been generally considered as effective in encouraging conservation, and more efficient utilization, of energy. Federal costs have been estimated considerably below equivalent prices for imported oil, but reflect only those costs incurred by the Federal Government. Total costs, to include private sector investment, are not available.

Question: What State activities have been most successful?

Answer: The more successful efforts involved an individualized method of contact with clients and the provision of recommendations for conservation actions which were technically oriented and tailored to the needs of the individual client.

Question: The State Energy Conservation Program funding level of $24,000,000 is a cut of 40% from FY 1981.

-- What impact has this had on the operation of State energy programs? Do State administrative costs absorb larger percentages, leaving less for services?

Answer: The 40% reduction in FY 1982 has impacted the State energy offices. DOE is presently in the process of reviewing FY 1982 State plans and awarding grants, and is not in a position to definitively analyze the FY 1982 program. However, DOE is aware that States have reduced their programs approximately 40%; personnel has been cut 15-20%; and some State energy offices have been reorganized and placed within another State office or department. As stated, no analysis has been made comparing administrative costs versus program costs, but it appears that most States are continuing the State Energy Conservation Program (SECP) and dropping the Supplemental State Energy Conservation Program (SSECP), which was not funded in FY 1982. Further, the reorganization and placement of State energy programs within other offices or departments indicates that States are attempting to mitigate increased administrative costs.

## Schools and Hospitals Program

Question: For FY 1982, there was a request for the schools and hospitals program because these institutions were not eligible for tax benefits.

-- What conditions changed to lead a decision to eliminate the schools and hospital grant program?

Answer: The President's decision to terminate this program in FY 1983 is based upon indications that the Nation will respond to higher energy prices by undertaking conservation efforts. Oil price decontrol and the President's economic recovery proposals should assist in effecting such investments. Federal support for this program is believed to be unnecessary since it is anticipated that the private sector and local governments will undertake such projects on its own in response to these high energy prices. Attention must be focused instead on institutional barriers to the conservation of energy in schools and hospitals. Removal of these barriers is considered more critical then direct Federal financing of conservation measures.

## Weatherization Assistance Program

Question: In part, your justification for terminating the low income weatherization program in DOE is the availability of funds for weatherization in the community development block grant in HUD and the ability of States to use up to 15 percent of low income fuel assistance money for weatherization.

-- How does the FY 1983 request for community development block grants programs compare to the amount available in FY 1981 and FY 1982?

-- To what extent have the States taken advantage of the ability to use up to 15 percent of low income fuel assistance funds for weatherization? Provide details for the record.

-- Has any State used the maximum 15 percent?

-- How does the FY 1983 request for low-income fuel assistance compare to the amount available in FY 1981 and FY 1982?

Answer: The Community Development Block Grant (CDBG) program received appropriations of $3.6946 billion in FY 1981 and $3.456 billion in FY 1982. The budget request for CDBG in FY 1983 is $3.456 billion.

The Department of Health and Human Services conducted a telephone survey in March 1982 on the planned use by States of Low-Income Home Energy Assistance Program (LIHEAP) in FY 1982. Forty-five States, plus the District of Columbia plan to utilize $178,738,490 in LIHEAP funds for low-cost weatherization efforts. Sixteen States plan to use the 15 percent maximum of LIHEAP funds for weatherization activities. The budget request for LIHEAP in FY 1983 is $1.3 billion. LIHEAP received appropriations of $1.85 billion in FY 1981 and $1.875 billion in FY 1982.

Question: If the weatherization program is continued in FY 1983, do you have any recommendations to make the program more effective? For example, could you spend less on each home, concentrating only on the most effective measures which would, in turn, allow you to reach more homes?

-- What procedure would you have to follow to make a change in the way you go about delivering the weatherization service?

Answer: The DOE weatherization program could be improved by making changes to the average cost per home, energy audit requirement, the income eligibility criteria and the energy measures list.

First, by reducing the average expenditure per home from $932 to $500, DOE could increase the number of families receiving assistance by 46 percent. This would also increase the amount of energy conserved in the aggregate because fewer, but the most cost-effective, measures would be installed in more homes. Legislatively reducing the $1,000 maximum cost per home limit to $800 would be needed to lower costs per home to an average of $500.

Second, allowing States to develop or utilize other energy audit procedures than the required "Retro-Tech" system could help coordinate energy planning. This would allow States the freedom of using the best audit procedure instead of using competing procedures that exist for other Federal programs. This would require a legislative change to relax the current requirement on energy audit standards for the program.

Third, by reducing the income eligibility standard from 125 percent to 100 percent of the OMB poverty guidelines, the program would serve those most in need and reduce the eligible number of households from 14 million to 10 million. This would require a legislative change.

Fourth, the elimination of the current measures list would allow States to select new energy conserving technologies and methods for use in the program. Currently, approved materials are listed in DOE regulations which often take up to a year to amend. A legislative change to eliminate the measures list requirement would be necessary.

## Energy Extension Service

Question: Provide the Committee, for the record, a description of the program you are carrying out with the FY 1982 appropriation for the Energy Extension Service.

Answer: The Energy Extension Service pulls together and uses existing information and assistance resources to provide the individual or "personalized" assistance that has been found to be most successful. It integrates and coordinates the delivery of energy assistance within the State and acts as a referral service to help energy consumers to find the services they need which may be offered by other programs. The FY 1982 EES programs being proposed by the States are now being reviewed and grant awards are being made. No comprehensive analysis has yet been made of the projects/programs that States propose to carry out. However, an informed review indicates that the States are continuing only those programs that proved successful in FY 1981, and no new or innovative projects are being proposed due to the substantial funding reduction from FY 1981 to FY 1982.

## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| **Critical Fluid Extraction**<br>Objective: To develop critical fluid extraction, a more efficient separation technology for liquid separations than distillation. | Separation by Solvent Extraction | Construction of a 4-inch laboratory pilot unit. Develop process parameters using an ethanol/water solution and fermentation beer as test materials. Incorporate the data in a computerized model of the system. Issue a final report on Phase I. | Conduct research on the critical fluid extraction system using the 4-inch pilot unit to develop processing parameters for separation of secbutanol and isopropanol, methyl ethyl ketone, or other high volume organic chemicals from water. The data will be incorporated into the the process model. |
| **Hydropyrolysis Development**<br>Objective: To develop a more efficient process for recovering process chemicals and energy in pulp production. | Hydropyrolytic Spent Liquor Discovery | Analysis of more efficient use of char from black liquor recovery and issuance of a report Analyze improvement in Kraft pulping efficiency resulting from hydropyrolysis and issue report. Continue research on chemistry of hydropyrolysis. | Complete the research on the chemistry of hydropyrolysis. Issue report. |
| **Oxygen Separation Systems** | Oxygen Production by Chemical Separation | Improve the laboratory unit to permit continuous operation. Determine parameters of continuous operation and incorporate data into process model. Continue corrosion tests. | Complete continuous operating tests in laboratory unit. Finalize process model. Complete corrosion tests. Issue report on Phase II. In addition, evaluate economics of process and potential market applications. Define a pilot plant and cost with industrial type equipment. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
|  | Magnetic Water | Complete preliminary survey of concept and literature search. Issue report. | Hold symposium on techniques for reducing energy use in industrial water treatment. Issue report. Initiate research, if warranted. |
| PNL Agriculture & Food Processing Support<br>Objective: To stimulate the implementation of energy conserving technologies by industry. | Meat and Dairy Case Histories | Complete 20 case histories documenting energy saving technologies in the meat and dairy industries. | Publish case histories, distribute, terminate. |
|  | Fruit Processing Improvement | Complete data gathering. | Issue final report. |
|  | Evaluation of ASM for Military | Get necessary approvals; initiate test. | Complete evaluation; final report. |
|  | Protein Waste Recovery | Install equipment for test purposes. Monitor operation. | Continue monitoring. Initiate testing of product; issue final report. |
| EADC'S<br>Objective: (1) Define energy conservation opportunities for small and medium-size firms.<br>(2) From results of completed audits, develop case studies of conservation opportunities that can be pursued by small and medium-sized firms. | Operation of Energy Analysis and Diagnostic Centers | Three EADC's continue operation; three new EADC's started. A total of 170 audits conducted. | Five EADC's continue in operation. 240 Audits conducted by those five. Procurement will be initiated for continuation of program. |

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## IMPROVED ENERGY PRODUCTIVITY

| Key Activity | Project Title | Activity FY 81 | Estimated Activity FY 82 (With 28.8MM Budget) |
|---|---|---|---|
| Reports and Manuals | Annual Industrial Energy Efficiency Report | Annual Report prepared, published and distributed. | Annual Report prepared, published and distributed. |
| | Energy Program Manuals for Small and Medium-Sized Companies | None | Work with NAM on development of energy information package. In addition, assemble manual which firms can use in assessing need for and means to establish and maintain internal energy conservation program. |
| Workshops and Seminars | Conservation Program Planning and Operation | None | 8-10 regionally-oriented workshops with the subject of "How to Plan and Carry Out an Energy Conservation Program for Small and Medium-Sized Industrial Firms." |
| | Voluntary Industrial Reporting Program Development | None | Plan and conduct 6 workshops to develop basis of voluntary energy reporting system with major industrial associations and corporations. |
| | Cupola Manual on Conversion to Stack Air | None | Contract with Penn State to prepare manual for conversion. Start work. |
| | Hot Inspection Workshop | None | Add task for Honeywell to make preparations at hot mill test site. |
| | Electric Arc Furnace Improvement | None | Presentation of furnace improvement technology. |

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Question: You are requesting $4,260,000 to administer prior year grants.

--What is the workload associated with this request?

—Does this amount include funds to follow-up on the Schools and Hospitals grants?

Answer: $4.26 million is required in FY 1983 to manage the close-out and monitoring activities for an estimated $ 242 million uncosted grants (outlays) carried over from FY 1982. A total of 64 FTE are needed to manage and close-out active grants in the following program areas:

| | Est. FY 1983 Outlays | Est. Number of Grants | FTE |
|---|---|---|---|
| Weatherization | $ 70 M | 76 | 16 |
| Energy Extension Service | 15 M | 57 | 5 |
| State Energy Conservation Prog. | 38 M | 57 | 9 |
| Inventions | 2 M | 120 | 2 |
| Appropriate Technology | 3 M | 1000 | 3 |
| Schools and Hospitals | 114 M | 5000 | 29 |

Staff associated with the Schools and Hospitals Program will allow for orderly termination of grants, but not for such follow-on activities as evaluation or audit.

## Obligational Status of Grants

Question: Please give the Committee an update on obligating the grant money available in FY 1982.

Answer: The State Energy Conservation Program (SECP), the Energy Extension Service (EES) and the Weatherization Assistance Program, for which the Congress appropriated $177.6 million in FY 1982, began issuing grant awards during the past quarter. As of April 16, 1982, 17 States had received their FY 1982 SECP grants, totalling $5.8 million (24% of the authorized amount), and 21 States had received their FY 1982 EES grants, totalling $3.1 million (32% of the authorized amount). FY 1982 awards under the Weatherization Assistance Program had been made to 25 States and 10 Indian tribes, for a total of $62.2 million (43% of the amount authorized to date). Grants under each of these programs are expected to be awarded to all States by the end of June.

The fourth grant cycle of the Schools and Hospitals Program began on April 13, 1982, with publication of the Federal Register notice allocating funds among States and territories. State-recommended applications to DOE are due on June 30, 1982, and DOE expects to obligate all of the FY 1982 appropriation by the close of this funding cycle on August 31, 1982.

## Home Energy Efficiency Improvement

Question: It is interesting to see in other parts of the DOE budget that there is money for home energy efficiency improvement. The Bonneville Power Administration request includes $214,590,000 for home energy efficiency improvement. Of this amount, $116,850,000 is for residential weatherization. $13,700,000 for water heater wraps, $7,780,000 for flow control and $26,260,000 for solar/heat pump water heater. Although we agree that these programs are worthwhile, why would you limit application of these programs to Bonneville Power constituents?

Answer: This electric rate payer financed program is authorized hy the Pacific Northwest Electric Power Planning and Conservation Act -- P.L. 96-501 of December 5, 1980 -- which requires Bonneville to meet regional electric loads and treat cost-effective electric energy conservation as the region's highest priority resource in meeting those loads.

Such activities are in fact appropriate for other utilities throughout the rest of the country and a number of them are initiating similar programs.

## Multi-Sector

Question: How many projects have been funded in the appropriate technology activity since its inception?

Answer: The program funded 2,398 projects in Fiscal Years 1978-1981.

Question: Over what time period will those projects be completed?

Answer: Of the 2,398 projects, 1,300 have been completed, 655 more will be completed by the end of FY 1982, and the remaining 443 will be completed during FY 1983.

Question: What is necessary to provide useful information to the using sector on the results of the projects?

Answer: The first requirement is to adequately document the results of the projects themselves. This means continuing to monitor the ongoing projects through completion, assuring acceptable final reports, and making those reports available to the public. Because of the large number of projects and the diversity of technologies and systems involved in the program, these 2,398 reports, while an essential data base, are in themselves of limited value to the public. The results need to be analyzed by technology area and summary manuals prepared for each significant area documenting the lessons learned and how they can be applied by the public. This would include analysis of the economics and energy impacts of alternative designs for specific technologies under variable local conditions, such as climate and local energy costs. These documents need to be made available to the public on a national and on a regional basis and the public informed of their availability.

Question: How much would annual activity like this cost until the projects were essentially complete?

Answer: The Administration considers the $2,880,000 appropriated in FY 1982 adequate for grant monitoring and information dissemination needs through the end of FY 1983. These funds will be obligated in FY 1982 for use through that period for those purposes, and no additional funds are needed.

Question: Have there been efforts to quantify the energy savings attributable to the appropriate technology program? If so, can you please share them with the Committee?

Answer: In a study conducted by the Lawrence Livermore Laboratory, 10% of the 584 projects funded by the appropriate technology program in FY 1979 were evaluated to determine, among other things, the direct and indirect energy savings. The conclusion was that the 584 projects funded in FY 1979, at a program cost of $8.0 million, would save (at the 75% confidence level) the equivalent of an estimated 9.6 to 36.1 million barrels of oil. These savings are estimated lifetime impacts from the funded projects and from follow-on replications and expansions stimulated in the following five years. These estimates were made without the benefit of significant operational experience for the systems constructed under the grants. A follow-on assessment will be conducted using part of the FY 1982 funds as part of the monitoring and information dissemination program, to substantially improve the reliability of the results.

Question: What activity is there in the Appropriate Technology Program in 1982?

Answer: There are 1,300 ongoing grants that were issued in 1979 - 1981. The 1982 activity consists of monitoring of those grants, developing an information dissemination program, and conducting a program evaluation.

Question: How do you plan to bring the program to a close? For example, what plans will remain to disseminate information from the program? Won't we be wasting our previous investment if information exhange projects are terminated?

Answer: The information from the completed grants will be analyzed and a series of publications prepared. In addition, an assessment will be made of the economics and energy savings of the various technologies and systems. All of the resulting information will be made available on a national and regional level so that it is in the hands of the private sector and state and local government entities who can make use of it in pursuing those appropriate technologies that make sense. The result should be active private development without further government support. The public will also have available data concerning those approaches that were found not to work out, so they can avoid repeating those experiments.

Question: Like appropriate technology, you plan to terminate the invention program. What can we point to as successes that have come from the Inventions Program?

Answer: It is still too early to assess the overall impact of the Inventions Program. Most of the inventions assisted by the program are still in the development stage. The program has helped to generate some new self-help initiatives by the private sector. These are still in the formative stage, but it appears that they will lead to improved sources of information and assistance for inventors. The recently formed National Congress of Inventor Organizations and the Office of Support of Technological Innovation of the American Association of Engineering Societies, both set up with assistance from the Energy-Related Inventions Program, will assist inventors with advice and information on patents, financing, licensing, and business development. The National Innovation Workshops conducted by the program have been attended by about 3,000 inventors, and have been highly regarded. We hope the National Congress of Inventor Organizations will continue these workshops.

Several specific inventions are already clear successes. For example, as part of an overall program evaluation being conducted by the

Oak Ridge National Laboratory, a sample of 30 projects were analyzed. This sample, with a government investment of $2,457,396, are already earning combined income of over $35,000,000. This income is attributable to the five inventions that have already entered the market place; and an additional 21 of the 30 are making significant progress toward the market place. Some specific examples of inventions that were successes are as follows:

In July 1977, DOE awarded a grant of $99,600 to Mr. G. R. Fitterer for his invention "Control of Low Carbon Aluminum Steel." The DOE grant was awarded for a system to conserve energy by monitoring and controlling the amount of oxygen in a carbon aluminum killed steel melt. The system was highly successful. The steel company involved has initiated another research effort to apply the technology to other ferro melts, and the inventor has been credited with saving a steel company with $18 million annual gross business from bankruptcy.

In September 1978, the DOE Inventions Program awarded a grant to Dan Ben-Schmeul, Heat Extractor Corporation, Johntown, New York, who used the $125,000 grant for a cooperative demonstration of his "Heat Extractor" at a Mohawk Paper Mills Plant. The device is a direct-contact heat exchanger that uses waste heat for heating water and has been installed at several hospitals and hotels. It has also been found very useful in certain industries that require large amounts of process hot water, hence the interest of Mohawk Paper Mills. The number of employees at the Extractor Corporation has increased from 20 to 250, and the company has a backlog of several million dollars in heat exhanger orders since the grant was awarded. Recently, Mr. Ben-Schmeul was successful in securing $400,000 in additional financing.

In September 1979, a grant was awarded to Mr. James Bagby for his "Mine Brattice." This device is a reusable brattice, which is a partition used to form ventilation passage in coal mines. The Bagby Brattice is claimed to be quick and inexpensive to install and seals better than present stoppings. If widely adopted, an improved air seal can save the equivalent of several thousand tons of coal per year in reduced ventilation energy requirements. In addition, maintenance personnel normally assigned to the task are made available for the primary task of extracting coal, thereby increasing the productivity of the mine.

The DOE grant was awarded to provide for the fabrication and installation of 25 prototype brattices in a southern Illinois underground coal mine. The terms of the grant provided that data would be collected over a 2 1/2 year period to measure the effects of natural subsidence on the performance of the brattices. Subsequent performance tests indicate that the device is already performing beyond all expectations and the tests have been terminated. The device has now been put into full-time use in this mine, and will soon be installed in other mines as well, with recent sales of $40,000 worth of brattices.

Michael Zinn, Bio-Energy System, Inc., Spring Glen, New York, was awarded a DOE grant of $110,000 in March 1980 to generate, analyze, collate, and assemble information on his "Solaroll" device in a form usable to others in the trade, and to operate and test the device for different applications. "Solaroll" is a flat-plate solar collector for hot water and building heating systems, intended for mass production. The collector is an extrusion of ethylene-propylene-diamene (EPDA) rubber and has the advantages of being easy and cheap to install. Mr. Zinn's Bio-Energy Systems has become a profitable business over the last 3 years. He has raised over $2.5 million in capital through a public stock offering, has sales of over $4 million a year and has secured a $350,000 SBA loan at 7% interest. He is now in the process of negotiating foreign licensing agreements.

In June 1980, a grant of $158,000 was awarded to Paul J. Cromwell. Paul J. Cromwell's Processing Recovery of Aluminum" is a mechanical separation process operated at room temperature (except for the final furnace melting step) for separating aluminum metal from the dross. The DOE grant was awarded to develop and optimize the complete design of a practical and economic production facility. Energy savings are an important part of this process, as aluminum has a high energy requirement for its initial production.

The major advantage of Mr. Cromwell's process is the significantly high yield, about 90 percent more recovered aluminum than by the other two commonly used methods, or around 40 to 45 percent primary metal per unit weight of dross. An inherent environmental advantage develops as a result of this efficiency: A low melting flux that is a carcinogenic hazard has to be added to the conventional feed to the furnace. The flux is not required in the Cromwell process, however, because the relatively smaller amounts of dross formed on the surface of the melt can be controlled at depth of 3/4 to 7/8" maximum. This oxide layer (dross) protects the liquid metal underneath, eliminating the use of the flux. It is estimated that Mr. Cromwell's process may represent an energy savings of about 3.1 billion kilowatt-hours per year.

Mr. Cromwell has now opened an aluminum dross processing plant in Buffalo, N.Y., secured $1.5 million in financing, plans to hire 50 employees in the near future and has letters of commitment to purchase $10 million per year of recovered dross.

In December 1978, Mr. Kenneth Stoffen was awarded a $53,000 grant for his "Air Cooled Compressor Heat Recovery and Heat Circulation System, Plus Ambient Air Filter and Air Cleaner for Same Compressor." The inventor has developed an environmental barrier or envelope (Ecology Package) to contain the heat exchanger surfaces and air intake for compressed air generation systems. The Department of Energy grant was awarded to Mr. Stofen to design and build the ecology packages, and to test and gather data on the operations of air-cooled compressors with ecology packages. Air-Cooled compressors have the advantage over water-cooled compressors in that they 1) eliminate requirements for cooling water, 2) can use heated air for space heat, and 3) require no sewage connection. At the 9th Annual World Fair for Technology Exchange, held March 10-13, 1981, in Atlanta, Georgia, Mr. Stofen's system was awarded first place in the Industry Division for "Significant Achievement in Technological Development."

In June 1979, Mr. Melvin Sachs was awarded an $87,000 grant for his "U-Foam Technology." The U-Foam Technology used rigid, lightweight aggregate insulation to provide the "foam-works" for the concrete structural members of a building when it is completed. The technique is estimated to cut construction time by one-third or more, and permits year-round workability of concrete without freezing. In one instance, Detroit Edison found the actual billings for total energy costs in a 120,000 square foot building in Livonia, Michigan (U-Foam Headquarters) averaged only $0.63/ft$^2$ for all energy consumed during 1978-79. This compares with Detroit Edison's own projection of $1.00 to $1.25/ft$^2$ for other thermally-efficient but more conventionally constructed buildings. U-Form received top honors in a competition for "significant achievement in technological development" at the Eight Annual World Fair for Technology Exchange in Atlanta, February 1980.

In December 1979, Mr. James Chill was awarded a grant of $124,000 for his "Process Development to Conserve Energy and Material -- (in the manufacture of)--Bearings". Mr. Chill's invention is a methodology for continously casting a sheet of the desire bearing alloy, in the desired thickness; casting it to the proper length; rolling it to the specified diameter; and welding it together. Mr. Chill's process thus reduces machining and other production costs. Also, the hot metal portion of the process can be completely isolated from the environment. Together with the reduction of machining operations, this drastically reduces environmental contamination from the highly toxic lead, which is a key ingredient in most bearings.

OSHA regulations (29CFR 1910.1025, Dec. 24, 1979) aimed primarily at open furnace melting of lead have placed stringent requirements upon the bearing industry. These requirements are roughly equivalent in stringency to the required isolated environment for handling of radioactive materials, necessitating, for example corresponding low air counts, clothing changes, and showers by workers before leaving the work area. Thus the bearing industry is faced with building altogether new facilities and adopting costly work procedures. Mr. Chill's new process is an economic alternative which makes the isolated environment condition easier and cheaper to attain than with conventional technology. At a January 12, 1981, hearing on the OSHA regulation, OSHA took the position that, because of Mr. Chill's technology, it was feasible for nonferrous foundries to abide by the subject standards.

Question: How many inventions have been evaluated over the life to the Program? How many have received grants?

Answer: NBS has evaluated 18,069 inventions to date and 128 have received grants from DOE. Six others have received support other than grants, such as laboratory testing.

Question: Do you have examples of economic and other incentives bringing together inventors, investors, and industry to exploit new concepts, products or processes to increase the Nation's energy productivity levels as stated in the budget justification?

Answer: We do not have specific examples at this time. However, as a result of the tax changes related to the capital gains tax and R&D tax credits, venture capital is available in the U.S. at a record rate. Worthy alternative energy-related inventions will compete with other technologies for a share of these investments.

## Selection Criteria for Energy Projects

Question: What criteria did you use in order to select the projects to be funded under the energy conversion and utilization technologies?

Answer: The projects in the Energy Conversion and Utilization Technologies (ECUT) program were selected based on their technical merits and their energy savings potential if successful. Other considerations were the degree to which the projects were generic and the need to continue selected ongoing projects to their logical conclusion or to a major milestone.

Question: What portion of the request is to continue projects presently being carried out in the FY 1982 program?

Answer: Of the $17.5 million budget proposed for FY 1983, $2.75 million is for projects presently being funded under ECUT.

## QUESTIONS SUBMITTED BY CONGRESSMAN LES AuCOIN

### Energy-Related Inventions Program

Question: The DOE/NBS Energy Related Inventions Program was established because it was felt that independent and very small companies were an important source of inventions, but special attention was needed if that source was to be used effectively in the national interest. Special attention was needed particularly to establish the credibility of inventions from the small inventor.

I understand that a group of independent consultants has analyzed 30 cases of inventions funded by the Program. From their preliminary findings, what can be said at this point with respect to the following:

a. The significance or importance of inventions funded by the Program;

b. The benefits of supported inventions relative to the grant amounts, for example in energy savings, new jobs, or income generation;

c. The specific role of the Program in achievement of benefits by supported inventions and performance of the private sector before and after the Program established credibility.

Answer: This question can best be answered by submitting for the record a statement of the preliminary fundings. A copy of the final results will also be furnished to the committee when they are available.

M. L. GRAD CONSULTANTS

Marcia L. Grad

February 8, 1982

Mr. Randy Stevens
Director, Energy-Related Inventions Program
Small Scale Technology Branch
Department of Energy
1000 Independence Avenue, S.W. Mail Stop GA017 CE24
Washington, D.C. 29585

Re: Evaluation of the Energy-Related Inventions Program

Dear Randy,

I just wanted to let you know that the case study volume of the Energy-Related Inventions Program evaluation is nearly complete and is now being typed at Oak Ridge National Laboratory. The typing is to be completed this week; Lois and I will proof the document one last time and a final draft will be mailed prior to publication of the volume by the laboratory.

We are now working on the synthesis/analysis volume and we thought it would be useful to provide you with our preliminary findings. You should note that this information will be presented and discussed in detail in the published volume.

As you know, the evaluation team examined thirty projects recommended by NBS for DOE support. The cases span the lifetime of the program and represent the range of administrative and policy strategies applied throughout the life of the program. The total funding level of the 30 cases is $2,457,396.00 with an average per case funding level of $81,913.00, including one project which was not funded. Interestingly only eight of these projects received a grant in excess of $100,000.00.

The Grantees

The inventors whose projects were supported are well educated, with 25 attending college (12 have Bachelor's degrees, 3 have master's degrees and 6 have doctorates). The five who did not attend college submitted inventions that grew out of their on-the-job experience.

The inventors we interviewed are entrepreneurial with three identifying themselves as self-employed and 21 who either own or are principal in a firm. Two are university professors and four are employed in private sector firms.

With respect to patent history, the inventors are evenly divided between those holding patents on previous inventions and those who do not. Fourteen inventors claim no patents prior to submitting their energy related inventions although they are characterized as creative with patentable ideas. Of the remaining 16 inventors,

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5 hold 5 or fewer patents, 5 hold 10 or fewer patents, 1 holds 15 patents, 1 holds 30 patents, 1 holds 38 U.S. patents and 2 claim more than 100 U.S. patents. Of the 30 inventions supported via DOE grants, 27 are patented.

Finally, we can tell you that the recommended inventions address problems the inventors have been working on for many years. Preliminary data indicate that they invested slightly more than an average of ten years per inventor in solving an energy-related problem. Furthermore, many have invested their own, or their company's cash, in developing the technology. Such cash investments range from $10,000 to $250,000 and do not include in-kind investments of time, equipment, etc.

Clearly, the grantees are reputable, responsible and experienced individuals who are serious about their work and the problems that they are trying to solve. And, their inventions are not of the "ah hah!" or "eureka!" variety, but are those evolving over the years and emerging from experience.

And, you should note that the program is funding individuals and smaller, new businesses which are higher investment risks -- risks that private sector organizations are not willing to take.

## The Technology

In the process of aggregating and analyzing data concerning the ERIP inventions, we are attempting to characterize them with respect to:

- Type of Innovation

  Bridesmaid (i.e., those larger companies will not pay to develop but will not interfere with and will buy if successfully developed)

  Invasionary (i.e., those larger companies hope will die because they will seriously challenge them if they are successful)

  Lynch-Pin (i.e., smaller incremental technologies that will substantially change one or more industries or put them out of business if they are successful)

- Expected energy impact
- Importance to the national interest
- Nature of investment risk

At this time we can identify cases which illustrate each of the foregoing categories.

We have evidence that many of the technologies, because of problems encountered prior to submission would have been shelved or taken several years longer to enter the market place if they had not been funded by the ERIP (e.g., Matteson, Cromwell, Wood, Sachs). We will apply the "but for" principle to each case in an attempt to determine what would have occurred if the government had not invested (i.e., intervened) in the case.

It is the consensus of all of us working on this project that most of the technologies have significant applications in one or more industries and they have the potential to positively affect the energy situation. The higher level of risk taken by ERIP program personnel, together with movement toward the market place facilitated by funding will pay off when the product/processes are commercialized.

## Outcomes

Outcomes are defined as the direct and indirect consequences of funding/support by the Energy-Related Inventions Program. No claim is made that all are caused by funding; rather that, in combination with the grantee's other activities, they occurred and are important in achieving one objective of the program - moving the technology closer to the marketplace. In the case of this program it is important to note that the completion of the work statement is, in itself, a tangible outcome because the work statement is negotiated between the grantee and the program officer with the specific objective of moving the technology forward in the innovation process.

Tangible outcomes are defined as those which can be seen or touched (e.g., test results, business plans, money, a building, equipment) while intangible outcomes are those reported by the inventor as important to his functioning as an inventor/entrepreneur (e.g., increased knowledge, ability to plan, ability to acquire capital, contacts within the local business infrastructure).

While data for all of the cases are not yet aggregated/analyzed, we can point to some of the more easily identifiable outcomes:

- Mr. Paul Cromwell has opened an aluminum dross processing plant in Buffalo, N.Y., secured $1.5 million in financing; and plans to hire 50 employees upon completing plant renovations; he has letters of commitment to purchase $10,000,000 per year of recovered dross.
- Mr. Daniel Ben-Shmuel has expanded his heat extractor business from almost no sales to a $25 million per year business employing 250 people he also secured a loan for $400,000.
- Mr. Enoch Durbin's research, while still in the prototype testing stage, has generated sufficient interest in Canada for the government to invest $6 million in the conduct of additional research on a new application.
- Mr. James A. Bagby has sold $40,000 worth of brattices since receiving his ERIP grant.
- Mr. Michael Zinn's Bio-Energy Systems has become a profitable business in the last three years; he has raised $2.5 million in capital via a public stock offering and now has sales of over $4,000,000 per year; also, he secured a $350,000 SBA loan at 7% interest.

- In 26 of the 30 cases the work statement was completed indicating progress toward the marketplace; of the remaining, one case was not supported, one is still in progress and two had work statements which are characterized as "too ambitious."

You should note that the foregoing are examples which stand out among all the cases as easily identifiable outcomes; there are other positive outcomes as well as cases in which there are no or negative outcomes. However, preliminary data indicate the ERIP has stimulated revenues and income in excess of the amount of money invested in the projects. For example, I noted earlier that these 30 cases represent a grant amount of $2.5 million and the sales of product noted above exceed $35 million which more than covers the government's investment.

Also, you should note that several of the cases involve inventions that are still in the early stages of development and may not reasonably be expected to achieve measurable commercial results for some time (e.g., Mahalla, Jablin, Engdahl).

All in all, it appears the study results will show that ERIP is a necessary and valuable program and that it functions where the private sector does not. For example, Ben-Shmuel and Cromwell sought private sector support prior to submitting their invention to ERIP and were unable to obtain it.

All of the consultants agree the federal government is getting a high yield on its investment and that it is taking risks, unusual in a government setting, to support significant technologies. Furthermore, the ERIP is supporting a segment of the business community that is hard pressed to obtain capital--or other needed elements of success -- either in the private or public sectors.

If you have any questions, please feel free to contact me.

Cordially,

Marcia

Marcia L. Grad

cc: George Lewett
Jon Soderstrom

MLG:am

Question: Are the consultant findings, summarized in the first question, in consonance with the Fiscal Year 1983 budget request for the Program? If not, why not?

Answer: The consultant findings are not necessarily in conflict with the FY 1983 budget request. The consultants, for instance, have not completed their analysis of what would have happened to those inventions without the Program. Furthermore, the increase in availability of venture capital and new tax incentives are expected to make private sector financing available for more such projects. In past years, venture capital was so scarce that only a very few new ideas could be financed. That is no longer the use.

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FRIDAY, APRIL 23, 1982.

## BUREAU OF MINES

### WITNESSES

DANIEL N. MILLER, JR., ASSISTANT SECRETARY FOR ENERGY AND MINERALS

ROBERT C. HORTON, DIRECTOR, BUREAU OF MINES

HERMANN ENZER, CHIEF ECONOMIST, BUREAU OF MINES

JOHN D. MORGAN, JR., CHIEF STAFF OFFICER, BUREAU OF MINES

THOMAS A HENRIE, CHIEF SCIENTIST, BUREAU OF MINES

WILLIAM D. OYLER, CHIEF, DIVISION OF BUDGET, BUREAU OF MINES

JOSEPH W. GORRELL, DIRECTOR OF BUDGET, OFFICE OF BUDGET, OFFICE OF THE SECRETARY

WILLIAM L. MILLER, ASSISTANT DIRECTOR, MINERALS AND MATERIALS RESEARCH

ARMOND A. SONNEK, ASSISTANT DIRECTOR, HELIUM OPERATIONS

PHILIP MEIKLE, ACTING CHIEF, DIVISION OF CONSERVATION AND DEVELOPMENT

JOSEPH L. PATRICK, ACTING CHIEF, DIVISION OF HEALTH AND SAFETY TECHNOLOGY

JOHN N. MURPHY, DIRECTOR OF RESEARCH, PITTSBURGH RESEARCH CENTER

JAMES PAONE, STAFF ASSISTANT TO THE ASSISTANT DIRECTOR, MINERALS DATA ANALYSIS

### OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order. This is the hearing on the appropriations for fiscal year 1983 for the Bureau of Mines. Appearing in support of its appropriation is Dr. Daniel Miller, Assistant Secretary for Energy and Minerals. We have met before. Mr. Horton, Director of the Bureau of Mines; Dr. Enzer, the economist. I remember Dr. Enzer. Dr. Morgan; Dr. Henrie, Chief Scientist; Mr. Horton; Mr. Oyler, Chief on the Budget; and Mr. Gorrell in the gallery, giving support and assistance.

The biographies of Mr. Horton and Dr. Enzer may go into the record at this point.

They will be followed by the statement of Mr. Horton.

[The biographies and statement follow:]

## Robert C. Horton
## Director, Bureau of Mines

Robert C. Horton became Director of the Bureau of Mines, U.S. Department of the Interior on September 22, 1981.

From May 1976 until his appointment by President Reagan, Mr. Horton was with the Bendix Field Engineering Corporation, first as a regional geologist in Reno, Nevada, and, from May 1977 to August 1981, as Director of the Geology Division in Grand Junction, Colorado. In that position, he was responsible for coordinating work on the National Uranium Resource Evaluation Program, overseeing 11 departments, a staff of 150, and nine field offices.

Mr. Horton was a mining consultant in Reno from 1972 to 1976, examining mines in the western United States, Canada, and Mexico, and was vice president of Transcon Industries, Inc., a small conglomerate with interests in petroleum and electronics, from 1967 to 1971. From 1956 to 1966, he was with the Nevada Bureau of Mines, rising to the position of Associate Director in 1965. While there, Mr. Horton also served, from 1959 to 1966, as Executive Secretary of the Nevada Oil and Gas Conservation Commission. From 1944 to 1946 and again from 1953 to 1955, he served with the U.S. Navy.

A native of Nevada, Mr. Horton received a B.Sc. degree in geological engineering from the Mackay School of Mines, University of Nevada, in 1949. He has authored more than 30 scientific and technical reports and articles. A registered Professional Geological Engineer, he served on Advisory Mining Boards for two Nevada governors, from 1967 to 1973. He is a member of the American Institute of Mining, Metallurgical, and Petroleum Engineers and the Society of Economic Geologists.

Mr. Horton was born July 25, 1926, in Tonopah, Nevada.

# BIOGRAPHICAL SKETCH
# OF
# DR. HERMANN ENZER
# CHIEF ECONOMIST, BUREAU OF MINES
# U.S. DEPARTMENT OF THE INTERIOR

Dr. Hermann Enzer, an economist who has specialized in mineral policy analysis since 1973, was recently appointed Chief Economist of the Bureau by Director Robert C. Horton. Between January 30, 1981 and September 21, 1981, Dr. Enzer served as Acting Director for the Bureau while his official Senior Executive Service position was Deputy Director for Minerals Information and Analysis.

Dr. Enzer received a bachelor's degree in economics, summa cum laude, from Boston University in 1959, a master's degree from that school in 1960, and a Ph.D. from Harvard in 1964.

From 1963 to 1973, he was a Professor of Economics and Statistics at the Air Force Institute of Technology of Dayton, Ohio, where he taught graduate courses in economics, conducted research, and provided consulting expertise to the Air Force and the Department of Defense.

Dr. Enzer joined the Interior Department in 1973 as an economist with the Office of Policy Analysis, transferring in the following year to the newly created Office of Minerals Policy and Research Analysis (OMPRA). He conducted studies including an analysis of data requirements for geophysical exploration of the Outer Continental Shelf, and an evaluation of oil shale leasing alternatives. In 1975 he became Director of the OMPRA.

The author of many publications, and the recipient of the U.S. Air Force Meritorious Civil Service Award, Dr. Enzer is a member of the American Economic Association, Econometric Society, and the Society for Industrial and Applied Mathematics.

Statement of
Robert C. Horton
Director, Bureau of Mines
Department of the Interior
House Subcommittee on Appropriations
on the Department of the Interior and Related Agencies
April 20, 1982

Mr. Chairman and Members of the Committee:

We are pleased to be here today to discuss the Bureau of Mines' budget request of $125,476,000 for fiscal year 1983.

This budget is consistent with the President's April 5 materials and minerals policy objectives. The Bureau of Mines fully supports the President's commitment to focus National attention on problems that affect both domestic and foreign availability of mineral supplies.

The budget request is $26,448,000 less than our 1983 base and $21,209,000 less than our 1982 appropriations. Of this decrease, $8,411,000 results primarily from a change in emphasis in research and development projects toward more basic work of wide generic application that offers high potential benefits in the long-term; and $3,554,000 results from completion of required mineral assessment work. The remaining $9,244,000 of the decrease represents a decision not to request funding for the Mineral Institutes. Funding for them was provided to the Bureau of Mines in fiscal year 1982 by the Congress. Accordingly the program was transferred to the Bureau from the Office of Surface Mining effective February 1, 1982. Funding is not requested because we believe the Mineral Institutes are not uniquely Federal and consequently they have other sources of public and private support available to them.

As has been reported to the Committee, the Advisory Committee on Mining and Mineral Research developed a plan for consolidating the research project grant portion of the Mineral Institutes program. The plan calls for funding 4 or 5 "Centers of Generic Mineral Technology." In FY 1982 these Centers will each receive "seed-money" grants of about $1 million each. These funds will be available for use over a period of years to permit orderly initiation of research that will attract more and continuing industrial participation.

Beginning in fiscal year 1982 and continuing into fiscal year 1983, the Bureau has increased its efforts to alleviate the Nation's problems with respect to strategic and critical materials. A 1983 program increase of $1,586,000 is proposed for additional research on strategic and critical materials, bringing the total to $23.2 million. This represents an overall increase of $8 million for this type of research above the original 1982 budget.

The 1983 request contains a new activity, General Administration, which was formed from the 1982 Common Program Services budget. In the 1982 budget these amounts were included with the Bureau's research and information programs. In the 1983 budget, these amounts have been extracted to fund the General Administration activity.

Effective October 1, 1981, the functions of the Office of Minerals Policy and Research Analysis (OMPRA) were transferred from the immediate office of the Assistant Secretary—Energy and Minerals to the Bureau of Mines. Nineteen full-time equivalent (FTE's) and $644,000 (the same level of resources as transferred in 1982) are included in the 1983 request for the Data Collection and Analysis program as a result of this transfer. The transfer of the Office has improved the Bureau's analytical capabilities and enhance accomplishment of its mineral development responsibilities.

The Construction and Rehabilitation activity provides for the engineering, design and construction of a new facility at the Bureau's installation near Bruceton, Pennsylvania. This is a replacement facility for the Bureau's activity now located at 4800 Forbes Avenue, Pittsburgh, Pennsylvania. Public Law 96-543 authorizes not more than $5,400,000 to be appropriated for this facility. Congress directed that $336,000 be made available in fiscal year 1982 for engineering and design within the Mines and Minerals 1982 appropriation. The Bureau is requesting a 1982 supplemental appropriation of $4,073,000 and approval to use $991,000 of unobligated balances from the Drainage of Anthracite Mines account to construct the facility. The FY 1982 amounts equal the authorization and therefore, no additional funding is needed or authorized to be requested in fiscal year 1983.

We are extremely pleased that after approval by the Secretary on February 1, 1982, we have an organization in the Bureau of Mines that will make the Bureau more responsive to the Nation's pressing needs in mineral policy formulation and in research. Streamlining the organization places greater emphasis on the line functions which are the strength of the Bureau.

The new organization components were in essence completely staffed and operational by March 31, 1982. This budget before you was prepared well before the new organization was approved. It therefore does not yet reflect the budget title changes which we shall consequently wish to make. In accordance with standing instructions, we will seek the Committee's approval of any changes in budget structure prior to submission of the budget for fiscal year 1984. We do not anticipate any major changes but would probably seek to retitle and align our subactivities with the new organizational units insofar as possible. One significant component of the reorganization included transfer of the Bureau's mined land demonstration work, under various authorities, to the Office of Surface Mining. Fifty-two persons were accordingly transferred effective March 22, 1982.

Mr. Chairman, I would like to highlight the budget request for each of our program areas and mention a few of our accomplishments during the past year.

## HIGHLIGHTS OF 1983 BUDGET

Of our 1983 request, $124,676,000 is for our Mines and Minerals appropriation and $800,000 is for use of trust funds deposited by States, local governments and private organizations with which the Bureau will conduct cooperative projects. The Mines and Minerals request includes $77,946,000 for research, $25,835,000 for information and analysis activities, and $20,895,000 for general administration.

## Research Programs

Our 1983 request of $77,946,000 for research programs includes $37,823,000 for Minerals Health and Safety Technology, $6,235,000 for Minerals Environmental Technology, and $33,888,000 for Mineral Resources Technology.

The 1983 request of $37,823,000 for the Minerals Health and Safety Technology program will continue highest priority research designed to: (1) develop a safe work environment to reduce injuries and continue the historic downward trend in fatalities; (2) promote a healthy work environment and thereby reduce disabling diseases and associated compensation payments; and (3) continue the transfer of new health and safety technology into mines and mineral processing plants. The proposed program decrease of $9,467,000 reflects a policy initiative that federally funded research and development emphasize basic research of a generic nature with long-term payoff. We believe industry has strong incentives to carry out, with its own resources, the research we are recommending be reduced. As a result of the 1981 tax legislation and with the continuing efforts of the Bureau of Mines to encourage industry participation in cooperative research, it is expected that industry will assume greater responsibility for funding demonstrations of Bureau developed technology including short-term research where an immediate benefit in improved health or safety can be achieved.

The goal of the Bureau's Minerals Environmental Technology program is to develop techniques to minimize undesirable environmental impacts associated with the production of minerals. The proposed program decrease of $4,329,000 results from our emphasizing higher priority basic research of a long-term high-risk nature related to the production of strategic and critical minerals from domestic resources. Specifically the 1983 request of $6,235,000 will allow progress in the areas of waste management, water management, subsidence prevention and control, reclamation technology and blasting, whereas efforts in specific lower priority areas such as process waste stream treatment, in-situ leaching, general environmental noise control, and non-coal revegetation will be reduced or deferred.

The Bureau's Mineral Resources Technology program is supportive of the Mining and Minerals Policy Act of 1970 and the National Materials and Minerals Policy, Research and Development Act of 1980, and the Administration's National Materials and Minerals Program Plan of April 5.

The structure of, and economic forces acting on, the mineral industry inhibit the broad level, long-range and high risk research and development which can provide options for responding to potential problems related to the availability of strategic and critical minerals. The objective of the Mineral Resources Technology program is to perform such research. The research program, for which a program increase of $1,586,000 and a total of $33,888,000 is being requested in fiscal year 1983, will develop knowledge for technological solutions to reduce requirements for and improve the supply of critical and strategic minerals through conservation, substitution, and increased economic recovery of minerals and metals from domestic resources.

The program increase of $1,586,000 requested for fiscal year 1983 will aid in recovering and conserving strategic and critical materials, including chromium, nickel, tungsten, and cobalt, through research on mineral processing techniques and recycling technologies.

Mr. Chairman I mentioned earlier the Bureau's efforts to stimulate increased cooperative research with industry, which is an essential component of our program and budget strategy. We have been aggressively working with the mining and mineral processing industries, especially the non-ferrous and iron ore companies, in establishing research associations to conduct cooperative research programs. Industry has been contacted and has agreed in principle. In the initial phase of this effort, a research association is being organized to conduct cooperative research on comminution (crushing and grinding) with participation from the Bureau of Mines, iron ore, non-ferrous metals, phosphate and portland cement companies, as well as grinding equipment manufacturers and engineering companies. This association will provide a framework within which industry can assume a greater portion of the Nation's commitment to minerals research. It is planned to broaden the scope of these activities through formation of other such associations. The results of these actions are expected to have a significant beneficial impact on progress toward resolving technological problems facing the Nation's minerals industry. We are enthusiastic about the long-range prospects for increasing coordinated industrial financing of mining and minerals research. We shall keep the Committee apprised of significant developments and we solicit your support of this important effort.

## Minerals Information and Analysis Programs

We are requesting $25,835,000 for minerals information and analysis activities: $20,408,000 for our Data Collection and Analysis program and $5,427,000 for our Land Assessments program.

The Data Collection and Analysis program collects and makes available worldwide information on approximately 100 nonfuel minerals. Using this information, analyses are performed to provide policy input, including assessments of international mineral supplies. There will be continuing efforts to provide coordination of nonfuel mineral data and analysis systems at the Federal Government level. No program change is proposed in this area.

The request for Land Assessments supports current schedules for Forest Service Wilderness and RARE II Further Planning Areas Studies. The program decrease of $4,085,000 is the result of fewer acres scheduled for assessment (since this phase of the program is nearing completion) and reduced per acre costs.

## General Administration

We are requesting $20,895,000 for General Administration in fiscal year 1983. This activity provides executive direction and administrative operations for the Bureau of Mines. In forming this activity from the old Common Program Services, costs for three items (Pittsburgh/Bruceton facility services, GSA space charges, and Bureau ADP services) are included, as appropriate, with the programs using these items or services. In fiscal year 1983, a program decrease of $909,000 is requested primarily as a result of operating efficiencies and to reflect reductions in operating programs.

## RECENT ACCOMPLISHMENTS

The Bureau of Mines has a long tradition of significant accomplishments, and I would like to highlight a few recent examples for you now.

Minerals Health and Safety Technology:

- A new water spray system called the "shearer-clearer" was developed to reduce the respirable dust exposure of longwall shearer operators. This system, or variations, is now being used by 24 longwall operations.

- A longer-than-seam height drill developed through Bureau research won the Industrial Research (IR) 100 award for design excellence in 1981. The drill facilitates installation of roof bolts in coal mine entries requiring bolts longer than the seam thickness.

- A device called the Geodynamic Accumulated Strain Sensor, which permits accurate measurement of accumulated strain or dynamic changes in strain in rocks, received the IR-100 award in 1981.

Minerals Environmental Technology:

- A "controlled burnout" system for the control and extinguishment of coal mine and waste bank fires is being demonstrated. The system captures heat which can potentially be used for the generation of electricity to offset costs of extinguishing fires. Both local government and industry groups have shown interest in commercial implementation.

Mineral Resources Technology

- The Bureau has developed technology that would conserve chromium through the economic regeneration and recycling of etching solutions which are used for various surface treatments.

- Bureau research to design a retractable diamond bit system for core drilling in deep underground mines has been completed. The system was recognized by the receipt of an IR-100 award.

- Through the Bureau's asbestos research, a new family of glass fibers has been discovered which has the potential of replacing asbestos in some of its uses.

- Bureau research on ion exchange resins to recover tungsten from geobrines was recognized as a significant technical achievement and received an IR-100 award.

- Fiber-reinforced materials have been studied and shown to have properties that would allow their substitution for some chromium-base alloys. These materials are intended to provide comparable performance to currently used materials so that a domestic alternate will be available.

## Data Collection and Analysis:

- Availability analyses of chromium, nickel, cobalt, manganese, and phosphate rock from domestic resources, and copper, aluminum, and platinum from worldwide resources have been completed by the Minerals Availability System (MAS). The MAS was also used by the General Accounting Office in their study of the effects of depletion allowance on the domestic mining industry (EMD - 81-13).

- Sixteen major data base and system components have been integrated into the Automated Minerals Information System (AMIS). Included are the summary data base for seven strategic and critical minerals.

- Mineral policy studies have been completed for three critical minerals: cobalt, chromium, and manganese. These analyses consider the question of U.S. vulnerability to a supply disruption and the effectiveness of alternative policy initiatives including a Strategic Stockpile release and a price support program for domestic production.

## Land Assessments:

- By the end of FY 1981, the Bureau and the U. S. Geological Survey jointly published reports on Forest Service Wilderness areas totaling 21.3 million acres out of the 25 million acres originally planned.

## General Administration

- The publication process for research findings and economic studies has been accelerated significantly. This process now permits the availability of summary reports on assessments of mineral potential on RARE II and proposed wilderness lands within two weeks of completion; and the publication of the three volumes of the Minerals Yearbook within 16 months of the end of the year for which the data were collected.

Mr. Chairman, that concludes my prepared remarks, and we shall be pleased to respond to any questions you may wish to raise.

## SUMMARY OF BUDGET REQUEST

Mr. **Yates**. Mr. Horton, your statement is in the record. Tell us about the appropriation for the Bureau of Mines.

Mr. **Horton**. Thank you.

Mr. **Yates**. How badly are you hurt? Do you have enough money to operate?

Mr. **Horton**. We do.

Mr. **Yates**. Could I possibly receive any other reply from you?

Mr. **Horton**. Unlikely, sir.

We are pleased to be here to discuss the Bureau of Mines' budget request of $125,476,000 for fiscal year 1983.

Mr. **Yates**. You will not read the whole statement?

Mr. **Horton**. No, sir.

Mr. **Yates**. Just give us the highlights, right?

Mr. **Horton**. Yes, sir.

This budget is consistent with the President's April 5th materials and minerals policy objectives. The Bureau of Mines fully supports the President's commitment to focus national attention on the problems that affect both foreign and domestic availability of mineral supplies.

Beginning in fiscal year 1982 and continuing into fiscal year 1983, the Bureau has increased its efforts to alleviate the Nation's problems with respect to strategic and critical materials. A 1983 program increase of $1,586,000 is proposed for additional research on strategic and critical materials, bringing the total to $23.2 million. This represents an overall increase of $8 million for this type of research above the original 1982 budget.

We are extremely pleased that on February 1, 1982, the Secretary approved a reorganization of the Bureau of Mines that will make it more responsive to the Nation's pressing needs in mineral policy formulation and in research. Streamlining the organization places greater emphasis on the line functions which are the strength of the Bureau.

In addition to the overall Bureau reorganization, several other functional responsibilities have been changed. The Office of Mineral Policy and Research Analysis has been transferred to the Bureau and the Bureau's mined land reclamation activities transferred to the Office of Surface Mining. Finally, the Mineral Institutes have been transferred to the Bureau from the Office of Surface Mining.

As has been reported to the committee, the Advisory Committee on Mining and Mineral Research developed a plan for consolidating the research project grant portion of the Mineral Institute's program. The plan calls for funding four or five centers of generic mineral technology.

In fiscal 1982, these centers will each receive seed-money grants of about $1 million each. These funds will be available for use over a period of years to provide orderly initiation of research that will attract more and continuing industrial participation.

The fiscal 1983 budget request for mines and minerals is $124,676,000, of which $77,946,000 is for research; $25,835,000 for information analysis; and $20,895,000 for general adminstration. In addition, we are requesting a fiscal year 1982 supplemental of

$4,073,000 and transfer of $991,000 in unobligated balances to make available a total of $5,064,000 to construct a new facility at our Bruceton, Pennsylvania station, to replace the building in downtown Pittsburgh which is to be sold to Carnegie-Mellon University.

We have listed some of the Bureau's accomplishments in the long statement, Mr. Chairman. I should just note in conclusion that four of our research projects resulted in receipt of Industrial Research 100 awards this last year. We are proud of that and other recognition of our work.

### SUMMARY OF U.S. MINERAL POSITION

If it meets with your satisfaction, Mr. Chairman, Dr. Morgan can give you a brief summary of our over-all mineral position.

Mr. YATES. Well, all right. We would love to have a summary by Dr. Morgan. How many years have you been giving summaries now, Dr. Morgan?

Dr. MORGAN. Oh, about eight or nine, sir.

Mr. YATES. Is that all? I seem to remember you going back to 1920.

Dr. MORGAN. Well, that could have been the stockpile hearings at the Armed Services Committee. Only eight or nine in this incarnation, though.

Mr. YATES. Okay. What is the status of our stockpile.

Dr. MORGAN. Where we stand, sir, first, we have to look at the——

Mr. YATES. Ordinarily you have a very attractive woman putting those charts up on the board.

Dr. MORGAN. We are saving money.

Mr. YATES. Is this the result of the new Reagan policy?

Dr. MORGAN. That is right, sir, she has been done away with and only older people like myself are here.

Mr. YATES. You are pretty smart, Dr. Morgan, but I do not think you qualify.

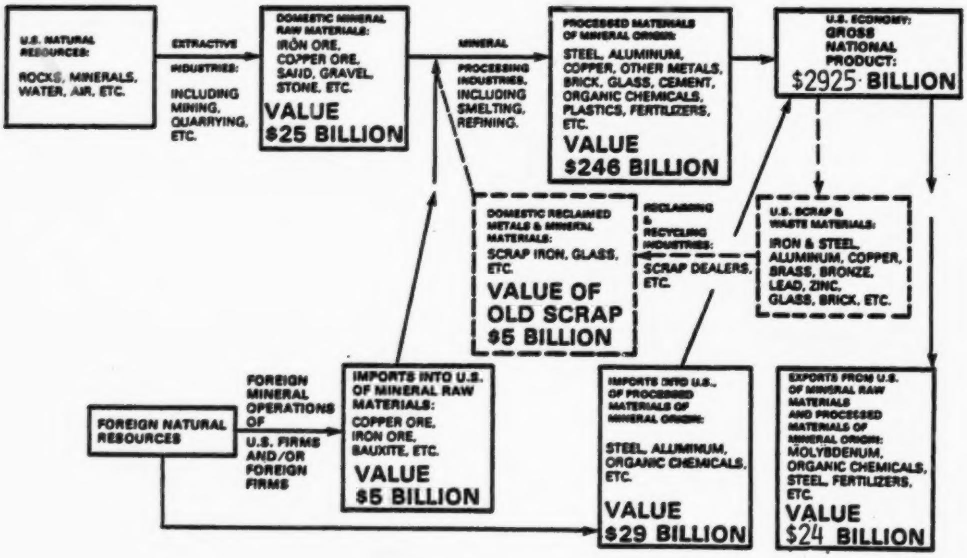
Dr. MORGAN. We have copies of all these charts, sir, for the committee. I will just run through them briefly and provide them for the record.

[The information follows:]

Fig. 1

# THE ROLE OF NONFUEL MINERALS IN THE U.S. ECONOMY

## (ESTIMATED VALUES FOR 1981)


U.S. NATURAL RESOURCES:
ROCKS, MINERALS, WATER, AIR, ETC.
EXTRACTIVE INDUSTRIES:
INCLUDING MINING, QUARRYING, ETC.
DOMESTIC MINERAL RAW MATERIALS:
IRON ORE, COPPER ORE, SAND, GRAVEL, STONE, ETC.
VALUE $25 BILLION
MINERAL PROCESSING INDUSTRIES, INCLUDING SMELTING, REFINING.
PROCESSED MATERIALS OF MINERAL ORIGIN:
STEEL, ALUMINUM, COPPER, OTHER METALS, BRICK, GLASS, CEMENT, ORGANIC CHEMICALS, PLASTICS, FERTILIZERS, ETC.
VALUE $246 BILLION
U.S. ECONOMY: GROSS NATIONAL PRODUCT:
$2925 BILLION
DOMESTIC RECLAIMED METALS & MINERAL MATERIALS:
SCRAP IRON, GLASS, ETC.
VALUE OF OLD SCRAP $5 BILLION
RECLAIMING & RECYCLING INDUSTRIES:
SCRAP DEALERS, ETC.
U.S. SCRAP & WASTE MATERIALS:
IRON & STEEL, ALUMINUM, COPPER, BRASS, BRONZE, LEAD, ZINC, GLASS, BRICK, ETC.
FOREIGN NATURAL RESOURCES
FOREIGN MINERAL OPERATIONS OF U.S. FIRMS AND/OR FOREIGN FIRMS
IMPORTS INTO U.S. OF MINERAL RAW MATERIALS:
COPPER ORE, IRON ORE, BAUXITE, ETC.
VALUE $5 BILLION
IMPORTS INTO U.S., OF PROCESSED MATERIALS OF MINERAL ORIGIN:
STEEL, ALUMINUM, ORGANIC CHEMICALS, ETC.
VALUE $29 BILLION
EXPORTS FROM U.S. OF MINERAL RAW MATERIALS AND PROCESSED MATERIALS OF MINERAL ORIGIN:
MOLYBDENUM, ORGANIC CHEMICALS, STEEL, FERTILIZERS, ETC.
VALUE $24 BILLION

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
(based in part on U.S. Department of Commerce data)

2/26/82

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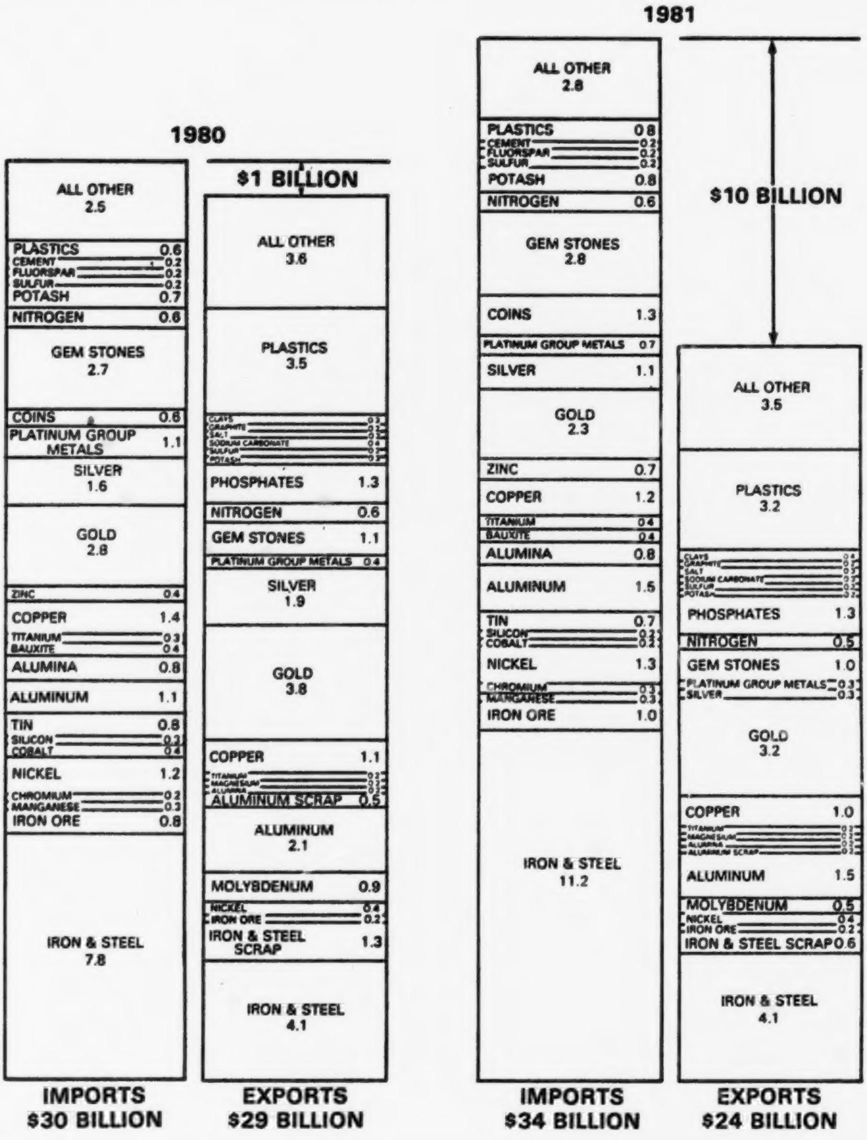
# Fig. 2 U.S. IMPORTS AND EXPORTS OF RAW AND PROCESSED NONFUEL MINERALS



FINAL 2/26/82

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
(data from Bureau of the Census)

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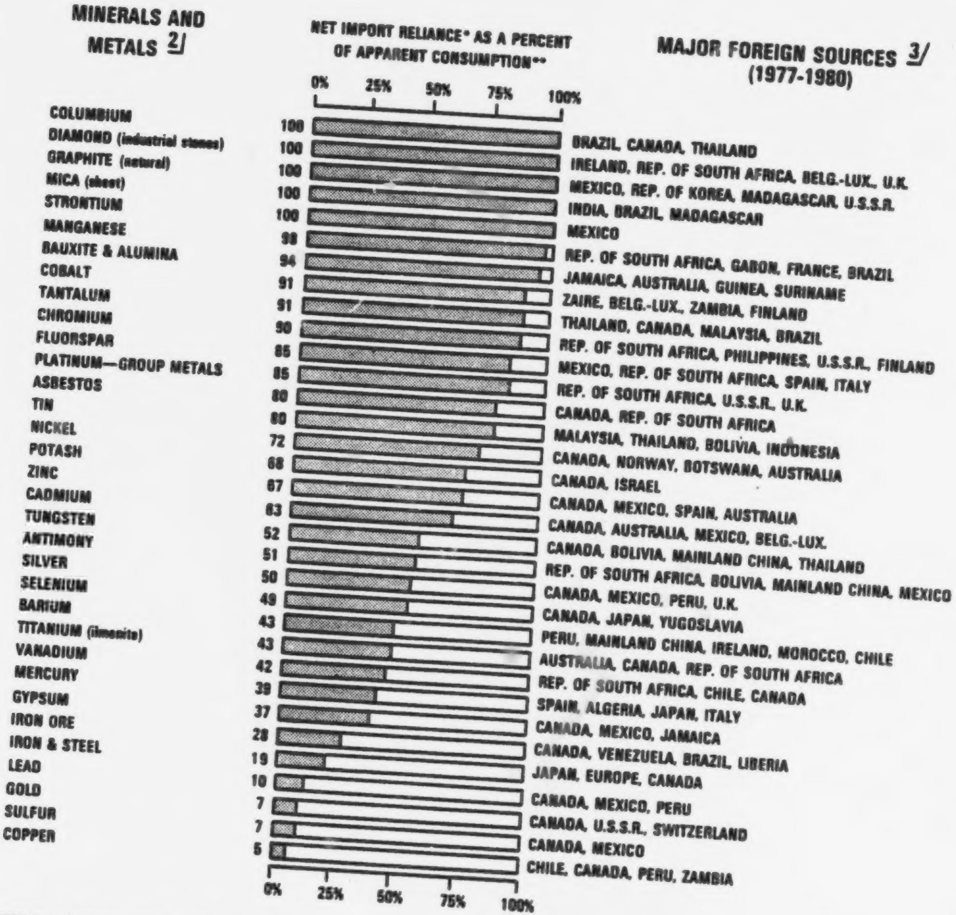
Fig. 3 U.S. NET IMPORT RELIANCE OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1981 1/



*NET IMPORT RELIANCE = IMPORTS-EXPORTS + ADJUSTMENTS FOR GOV'T AND INDUSTRY STOCK CHANGES.

**APPARENT CONSUMPTION = U.S. PRIMARY + SECONDARY PRODUCTION + NET IMPORT RELIANCE.

1/ JANUARY 28, 1982 (ESTIMATE).

2/ SUBSTANTIAL QUANTITIES ARE IMPORTED FOR RUTILE, RHENIUM AND ZIRCON. DATA WITHHELD TO AVOID DISCLOSING COMPANY PROPRIETARY DATA.

3/ SOURCES SHOWN ARE POINTS OF SHIPMENT TO THE U.S. AND ARE NOT NECESSARILY THE INITIAL SOURCES OF THE MATERIAL.

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
(import-export data from Bureau of the Census)

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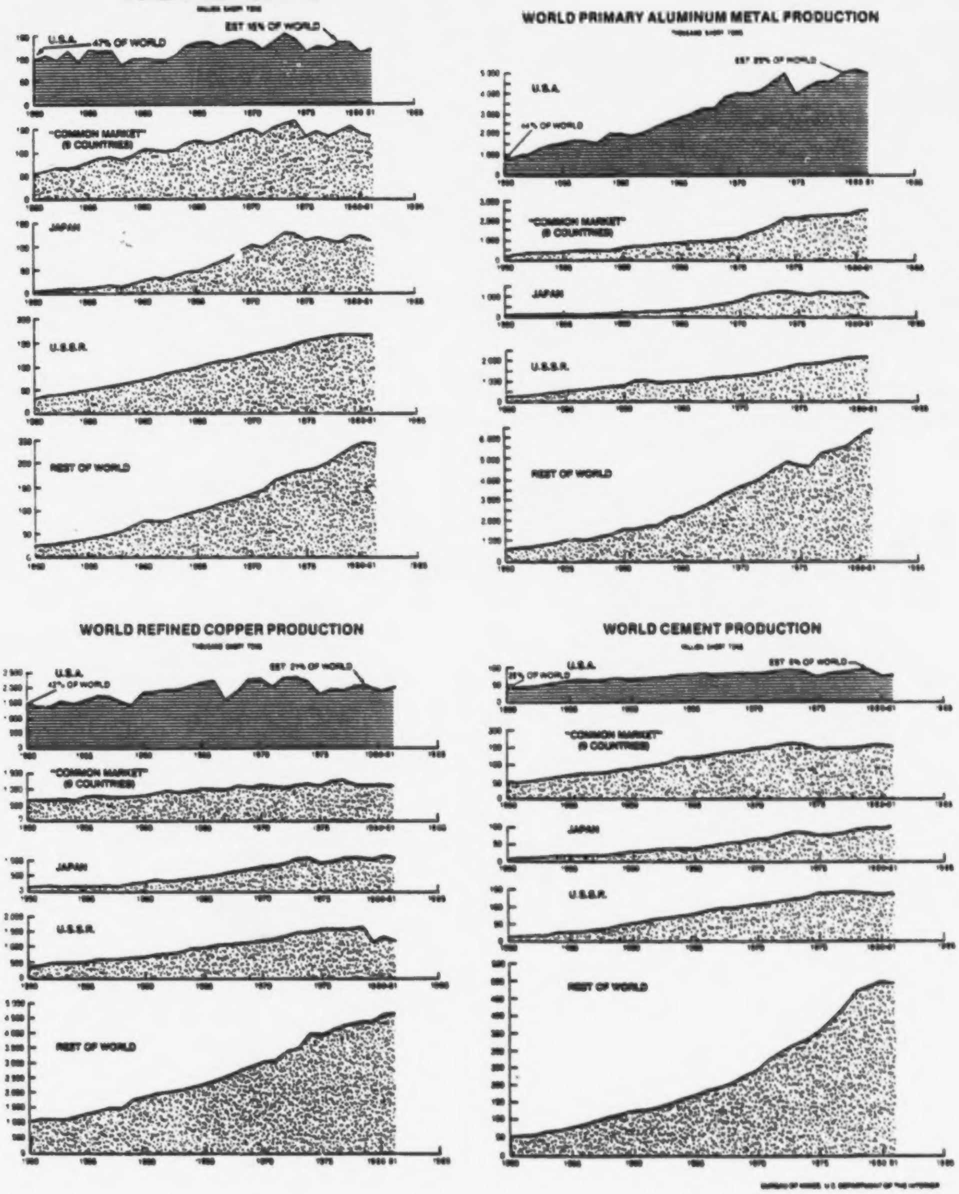
Fig. 4



WORLD STEEL PRODUCTION

MILLION SHORT TONS

WORLD PRIMARY ALUMINUM METAL PRODUCTION

THOUSAND SHORT TONS

WORLD REFINED COPPER PRODUCTION

THOUSAND SHORT TONS

WORLD CEMENT PRODUCTION

MILLION SHORT TONS

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR

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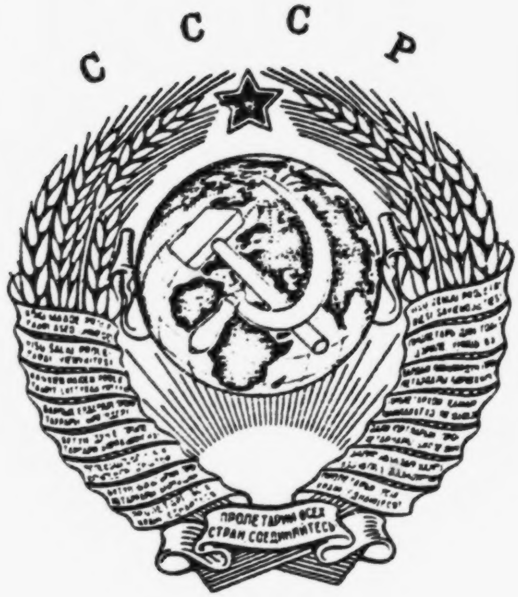
Fig. 7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ПРОЛЕТАРИИ ВСЕХ
СТРАН СОЕДИНЯЙТЕСЬ

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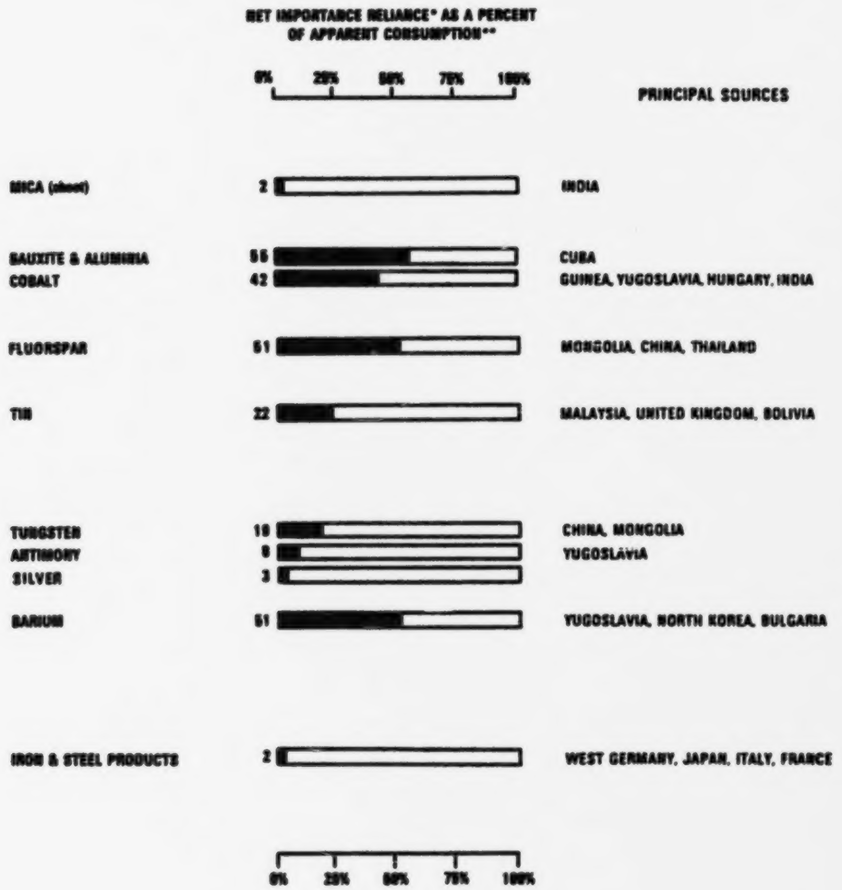
Fig. 8

# U.S.S.R. NET IMPORT RELIANCE OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1981



BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
4/21/82

Dr. MORGAN. What we are concerned with is the mineral base that supports our entire economy.

Mr. YATES. Right.

Dr. MORGAN. In 1981, the economy was a $3 trillion economy and it was supported by $97 billion of domestic crude oil, $62 billion of imported crude oil, $19 billion of imported refined petroleum, $42 billion of domestic natural gas, $19 billion of domestic coal, $1 billion of domestic uranium, and then $240 billion of processed domestic nonfuel minerals, and I will speak to that in a moment.

You know, of course, sir, that energy is under the Department of Energy, but we in the Bureau of Mines still keep our eye on coal, petroleum, natural gas, oil shale, tar sands, uranium, et cetera, because we are responsible for health and safety research under the act.

Mr. YATES. It's just as well that you do because I think the Department of Energy is really in shambles right now.

Dr. MORGAN. We are trying to keep track of it as best we can. I have diagramed our energy dependence on the chart here just to give you a——

Mr. YATES. The reason I am smiling is I do not remember any other year where you turned charts around.

Dr. MORGAN. This is part of our saving program, also. We use both sides.

Mr. YATES. Okay. Looks like a nice contemporary art presentation.

Dr. MORGAN. Yes, sir. You could put it in your fine arts displays.

Mr. YATES. We will save it for the Endowment for the Arts when they come in.

Dr. MORGAN. Last year, 27 percent of our energy was from domestic natural gas; 4 percent from hydroelectric power; 4 percent from nuclear power; 22 percent from domestic coal; 26 percent from domestic petroleum; and 17 percent from imported petroleum, crude and refined. That is why we set——

Mr. YATES. Do we have a copy of that?

Dr. MORGAN. Yes, sir. You do not have the picture, but the table is there.

Mr. YATES. I see. Not nearly as graphic but go ahead.

### FUEL MINERALS IN THE U.S. ECONOMY

Dr. MORGAN. Looking now primarily at nonfuel minerals, which is our main area of responsibility, in figure 1 we have diagramed on the top row the domestic activity, and on the bottom, the foreign activity, so you can see the relationship between the two.

Mr. YATES. There is also another box there.

Dr. MORGAN. Yes, sir, that is the exports.

Mr. YATES. Okay.

Dr. MORGAN. Domestic production in the raw form was worth $25 billion. We imported in corresponding raw form, $5 billion. So the dependence, 5 to 30 in dollars, is not too great on the raw side.

On the processed side, we had $239 billion of domestic, $29 billion imported processed material, so again 30 to 270, dollarwise, the import dependence is not too great in dollars.

The interesting thing, I think, is the value added by the manufacturing or processing whereby the $25 billion of raw domestic minerals plus the $5 billion of raw foreign minerals plus the $5 billion of scrap gets to be $239 billion, about a 7 to 1 multiplier at that point, to support the $3 trillion GNP.

We also exported $24 billion of raw and process, so we have $5 coming in raw, $29 coming in process, that is $34, we exported $24, so we had a trade deficit of $10 billion.

### NONFUEL MINERALS DEFICIT

Now, you might wonder which materials accounted for that deficit and how does it look from the prior year. Figure 2 compares 1981 to 1980. In 1980, the deficit in the nonfuel minerals was only $1 billion. In 1981, the deficit changed to $10 billion because the exports dropped and the imports increased.

Mr. YATES. Just tell us what represents the difference.

Dr. MORGAN. The biggest single item accounting for this $10 billion deficit are the iron and steel imports of $11 billion. Iron and steel accounts for a third of the total imports.

Mr. YATES. Why do we do that?

Dr. MORGAN. Well, I guess the material is produced more cheaply abroad and that is why the Congress and the industry are particularly concerned with the level of iron and steel imports. They rose to be 19 percent of consumption last year.

Mr. YATES. Are those processed iron and steel products?

Dr. MORGAN. Yes, sir.

Mr. YATES. That is in dollars, not in volume.

Dr. MORGAN. That is in dollars.

Mr. YATES. What is the difference in volume?

Dr. MORGAN. The volume of the iron and steel would be 19 percent of roughly 100 million tons, so that would be about 19 or 20 million tons on a tonnage basis of processed material.

Mr. YATES. How does that compare with 1980? You have a comparison between 1981 and 1980 on the chart, and you have told us what it would be in 1981. How does that compare in volume with 1980?

Dr. MORGAN. The year before it was 16 percent, so it grew from 16 to 19 percent in one year.

Most of the increase came from the European Economic Community. It comes about a third from Japan, a third from the European Community and a third from a variety of other countries. But it is the European Community that increased the most.

### IMPORT DEPENDENCE OF SELECTED MINERALS

Now, we are not only looking at the dollar value, but we have to look at the relative import dependence, because even though the dollars involved in some of these are small, the question arises how import dependent are we and how vulnerable, how dangerous a situation might this be?

Figure 3 shows import dependence.

We have diagramed about 35 highly important commodities where we are import dependent to some degree. We also show the major foreign sources averaged over a 4-year period, which I think is more meaningful than just 1 year, because of annual supply perturbations.

The first listed country is the most important supplier; and the other major ones are listed in declining order. One thing that stands out is that about a quarter of all of our nonfuel mineral imports come from Canada. We have a pretty good reliance and working relationship with Canada.

A number of these in the high import area come from countries that we have fairly good relationships with, but there are also some materials that give us cause to worry, and for that reason I will speak a little more about the status of the stockpile.

Mr. YATES. I had the impression that most of our industrial diamonds came from South Africa; your chart indicates most come from Ireland.

Dr. MORGAN. That is the source from which imported whereas the raw diamonds probably came from South Africa or Namibia, and they are processed in Ireland or Belgium-Luxembourg. So this shows the import point, not the original source.

Mr. YATES. Does our national stockpile take that chart into consideration?

Dr. MORGAN. Yes, sir, exactly. If I may lead up to the stockpile by one other chart.

Mr. YATES. Sure.

Dr. MORGAN. On figure 3, iron ore, iron and steel and lead are relatively low on the chart, and we do not show aluminum metal because we are virtually self-sufficient in aluminum metal, though we do import over 90 percent of our bauxite and alumina. I mentioned the iron and steel where we are 19 percent import dependent at the present time.

### U.S. AND WORLD PRODUCTION OF SELECTED MATERIALS

There is not any great vulnerability problem with respect to common materials like aluminum and copper, and that is why I would like to show figure 4 which shows U.S. and world production for the past 30 years, starting in 1950 through 1981, for steel, aluminum, copper, and a major nonmetallic, cement.

These four are the big construction materials for almost everything. When we come to defense planning, the four "controlled materials" for the control of the economy are steel, aluminum, copper and nickel.

In 1950, the start of the Korean War, we produced about half of the world's steel, nearly half of the world's aluminum, nearly half of the world's copper, and a third of the world's cement.

In that 30-year period, the U.S. production has grown in every case. However, what has happened is that in the rest of the world production has grown even more, so that today we produce only about a sixth of the world's steel, only about a quarter or a third of the world's aluminum, only about a quarter of the world's copper, and even less than 10 percent of the world's cement.

Now, in a way I think this shows a very favorable situation. This is something that the United States Government has been trying to encourage by the Marshall Plan and the foreign aid over the years. We have greater supplies than at any time in history.

Mr. YATES. And greater competition.

Dr. MORGAN. Right. And this has enabled the people in the rest of the world to improve their material standard of living and there are far more sources for us to call upon in an economic way, not taking into consideration, however, the strategic situation.

Therefore, the stockpile has to look not only at the economic but also at the strategic situation.

Figure 5 shows U.S. use as a percent of world mine production. We use about a sixth of the world's chromium, a major ingredient in stainless steel. We use 20 percent of the world's columbium, 23 percent of cobalt, 29 percent of titanium, 31 percent of nickel, 35 percent of platinum, and in the case of a relatively obscure material, last year we used 128 percent of the world's mine production of tantalum.

So, the point is that while there are plenty of common materials like the steel, copper, aluminum and cement, that with respect to the materials that possess special properties, like the ones on figure 5, are the ones that make our high technology possible, and the ones that the Defense Department will look increasingly to as the Defense budget goes to $257 billion, which they are asking for in 1983, compared to $214 billion in 1982. These are the materials that there will be more impact on.

Many of these special property materials come from distant and obscure sources. For example, the greater proportion of our cobalt from Zaire and some from Zambia. The nickel from Canada is secure, much of the chromium and platinum comes from southeastern Africa, tantalum Thailand and Malaysia and so on.

So these are the materials that we have to particularly keep our eye on.

### STOCKPILE STATUS

Figure 6 and table 1 detail our stockpile status. In all, 93 commodities are stockpiled, but only a few major ones are convered in the figure.

Mr. YATES. Did we not sell some of the metals that are below the 100 percent target over the last 2 years?

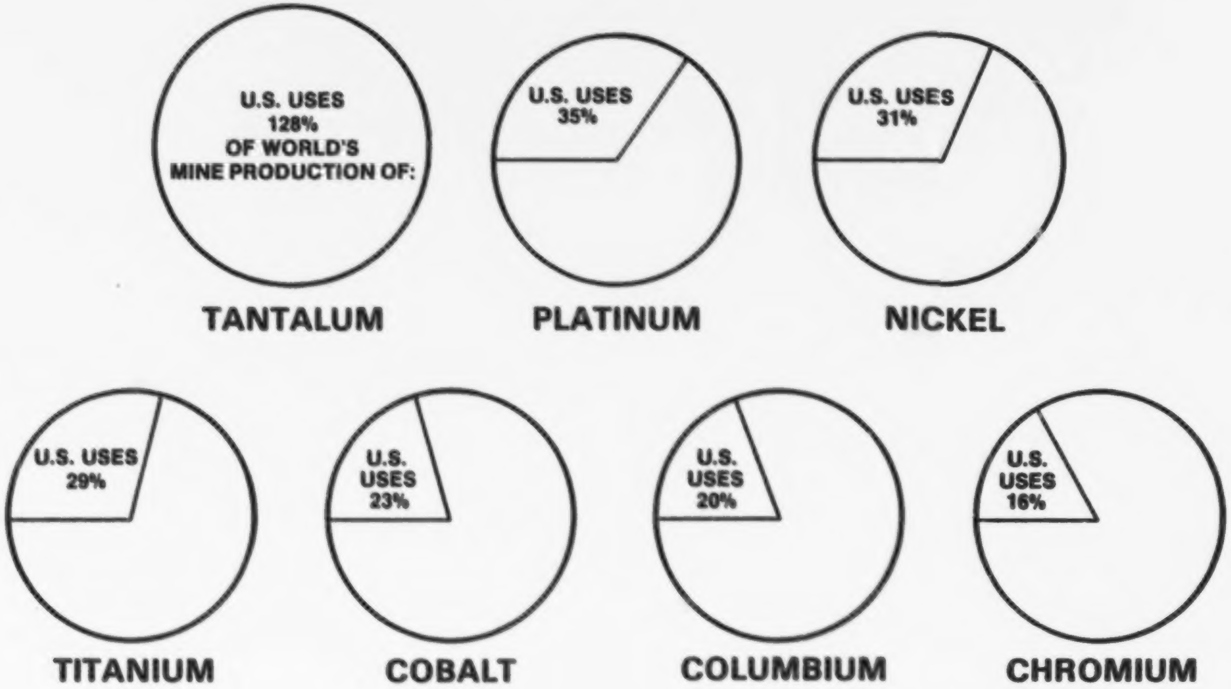
Dr. MORGAN. We did indeed, sir, because from World War II to 1958, the Government planned on a 5-year war period. From 1958 to 1973, we planned on a 3-year war period, but from 1973 to 1976 we planned on a 1-year period. The war period is the biggest single multiplier, so, at that point, they sold off $3 to $4 billion worth.

Mr. YATES. Why are they considered deficient if they have changed their concepts of the needs for the stockpile? Why do you show them as being deficient?

Dr. MORGAN. They are deficient because the Administration under President Ford in 1976 reviewed the status of the stockpile and said that the change to the 1 year was wrong, and that we should go back to the 3-year period. which, incidentally, the Bureau of Mines had endorsed all along.

The 3-year planning basis was reaffirmed by President Carter in 1977, and it was made mandatory by the Congress in the Stock Piling Act of 1979.

Fig. 5 U.S. 1981 USE AS A % OF WORLD MINE PRODUCTION



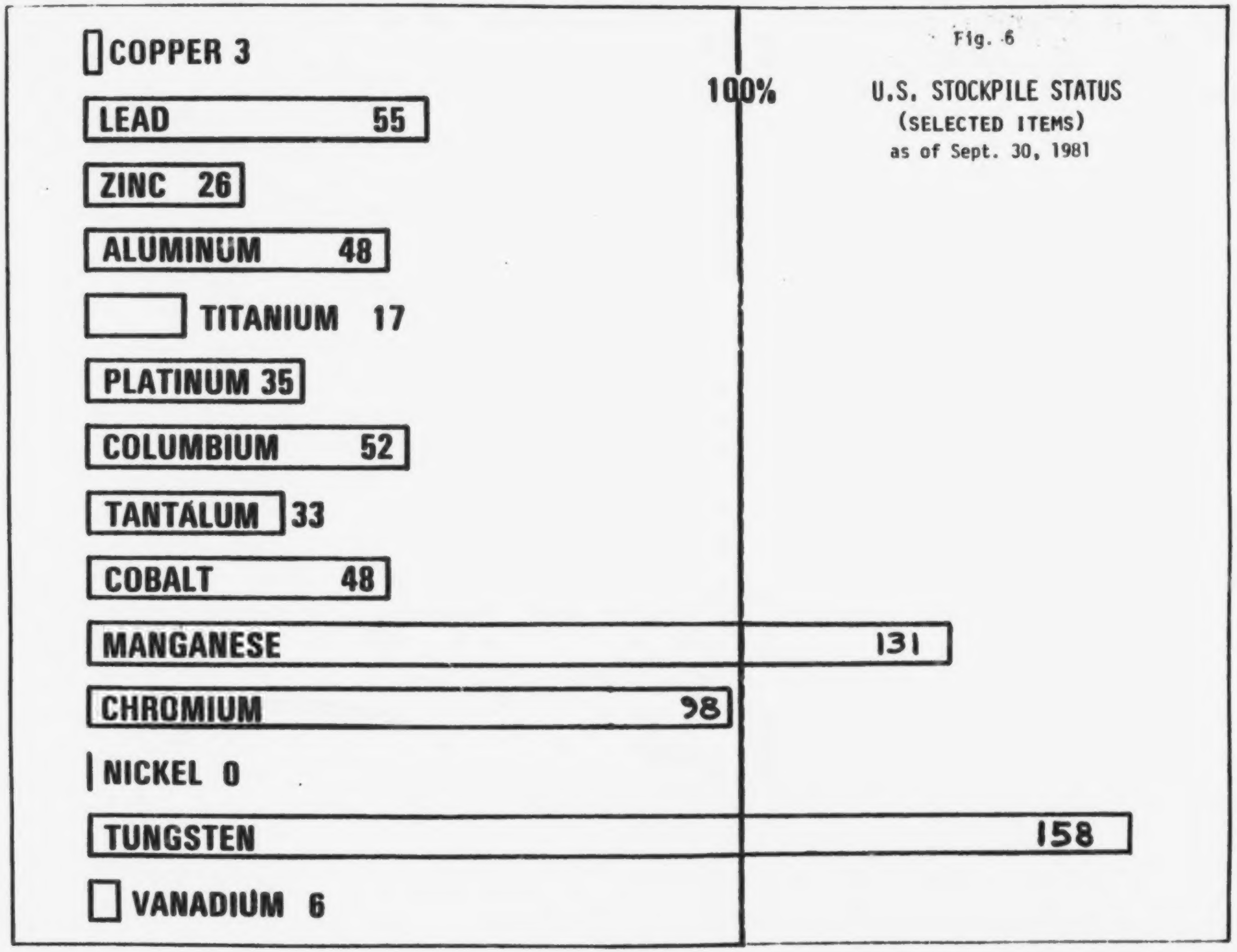


Fig. 6

U.S. STOCKPILE STATUS
(SELECTED ITEMS)
as of Sept. 30, 1981

Source: FEMA

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Table 1 . FEMA's STOCKPILE GOALS, (DESIRED INVENTORY MIX), AND INVENTORIES AS OF SEPTEMBER 30, 1981

| | Goal | Inventory |
|---|---|---|
| Aluminum Metal Group | 7,150,000 ST Al | 3,444,064 |
| (Alumina) | 0 | 0 |
| (Aluminum) | 700,000 ST | 1,733 |
| (Bauxite, Metal Grade, Jamaica Type) | 21,000,000 LDT | 8,858,881 |
| (Bauxite, Metal Grade, Surinam Type) | 6,100,000 LDT | 5,299,596 |
| Aluminum Oxide, Abrasive Grain Group | 638,000 ST Abrasive Grain | 259,124 |
| (Aluminum Oxide, Abrasive Grain) | 0 ST | 50,904 |
| (Aluminum Oxide, Fused, Crude) | 0 ST | 249,867 |
| (Bauxite, Abrasive Grade) | 1,000,000 LCT | 0 |
| Antimony | 36,000 ST | 40,730 |
| Asbestos, Amosite | 17,000 ST | 42,534 |
| Asbestos, Chrysotile | 3,000 ST | 9,958 |
| Bauxite, Refractory | 1,400,000 LCT | 174,599 |
| Beryllium Metal Group | 1,220 ST Be Metal | 1,061 |
| (Beryl Ore 11% BeO) | 18,000 ST | 17,987 |
| (Beryllium Copper Master Alloy) | 7,900 ST | 7,387 |
| (Beryllium Metal) | 400 ST | 229 |
| Bismuth | 2,200,000 LB | 2,081,298 |
| Cadmium | 11,700,000 LB | 6,328,809 |
| Castor Oil (Sebacic Acid) | 22,000,000 LB | 12,524,243 |
| Chromium, Chemical & Metallurgical Group | 1,353,000 ST Cr Metal | 1,324,921 |
| (Chromite, Chemical Grade Ore) | 675,000 SDT | 242,414 |
| (Chromite, Metallurgical Grade Ore) | 3,200,000 SDT | 2,488,043 |
| (Chromium, Ferro, High Carbon) | 185,000 ST | 402,696 |
| (Chromium, Ferro, Low Carbon) | 75,000 ST | 318,892 |
| (Chromium, Ferro, Silicon) | 90,000 ST | 58,355 |
| (Chromium, Metal) | 20,000 ST | 3,763 |
| Chromite, Refractory Grade Ore | 850,000 SDT | 391,414 |
| Cobalt | 85,400,000 LB Co | 40,802,393 |
| Columbium Group | 4,850,000 LB Cb Metal | 2,510,528 |
| (Columbium Carbide Powder) | 100,000 LB Cb | 21,372 |
| (Columbium Concentrates) | 5,600,000 LB Cb | 1,780,463 |
| (Columbium, Ferro) | 0 LB Cb | 930,911 |
| (Columbium, Metal) | 0 LB Cb | 44,851 |
| Copper | 1,000,000 ST | 29,048 |
| Cordage Fibers, Abaca | 155,000,000 LB | 0 |
| Cordage Fibers, Sisal | 60,000,000 LB | 0 |
| Diamond, Industrial Group | 29,700,000 KT | 41,939,184 |
| (Diamond Dies, Small) | 60,000 PC | 25,473 |
| (Diamond, Industrial, Crushing Bort) | 22,000,000 KT | 23,692,782 |
| (Diamond, Industrial, Stones) | 7,700,000 KT | 18,233,666 |
| Feathers & Down | 1,500,000 LB | 0 |
| Fluorspar, Acid Grade | 1,400,000 SDT | 895,983 |
| Fluorspar, Metallurgical Grade | 1,700,000 SDT | 411,738 |
| Graphite, Natural - Ceylon, Amorphous Lump | 6,300 ST | 5,499 |
| Graphite, Natural - Malagasy, Crystalline | 20,000 ST | 17,904 |
| Graphite, Natural - Other than Ceylon & Malagasy | 2,800 ST | 2,804 |
| Iodine | 5,800,000 LB | 8,013,074 |
| Jewel Bearings | 120,000,000 PC | 69,908,738 |
| Lead | 1,100,000 ST | 601,036 |
| Manganese Dioxide, Battery Grade Group | 87,000 SDT | 222,136 |
| (Manganese, Battery Grade, Natural Ore) | 62,000 SDT | 219,125 |
| (Manganese, Battery Grade, Synthetic Dioxide) | 25,000 SDT | 3,011 |
| Manganese, Chemical & Metallurgical Group | 1,500,000 ST Mn Metal | 1,970,715 |
| (Manganese Ore, Chemical Grade) | 170,000 SDT | 221,044 |
| (Manganese Ore, Metallurgical Grade) | 2,700,000 SDT | 3,370,085 |
| (Manganese, Ferro, High Carbon) | 439,000 ST | 599,978 |
| (Manganese, Ferro, Low Carbon) | 0 ST | 0 |
| (Manganese, Ferro, Medium Carbon) | 0 ST | 28,920 |
| (Manganese, Ferro, Silicon) | 0 ST | 23,574 |
| (Manganese, Metal, Electrolytic) | 0 ST | 14,172 |
| Mercury | 10,500 Flasks | 191,391 |
| Mica, Muscovite, Block, Stained & Better | 6,200,000 LB | 5,212,444 |
| Mica, Muscovite Film, 1st & 2nd Qualities | 90,000 LB | 1,274,489 |
| Mica, Muscovite Splittings | 12,630,000 LB | 19,035,147 |
| Mica, Phlogopite Block | 210,000 LB | 130,745 |
| Mica, Phlogopite Splittings | 930,000 LB | 1,704,097 |
| Molybdenum Group | 0 | 0 |
| (Molybdenum Disulphide) | 0 | 0 |
| (Molybdenum, Ferro) | 0 | 0 |
| Nickel | 200,000 ST Ni + Co | 0 |
| Opium Group | 130,000 AMA LB | 71,303 |
| (Opium Gum) | 0 AMA LB | 31,795 |
| (Opium, Salt) | 130,000 AMA LB | 39,508 |
| Platinum Group Metals, Iridium | 98,000 TrOz | 16,991 |
| Platinum Group Metals, Palladium | 3,000,000 TrOz | 1,255,003 |
| Platinum Group Metals, Platinum | 1,310,000 TrOz | 452,640 |
| Pyrethrum | 500,000 LB | 0 |
| Quartz Crystals | 600,000 LB | 2,128,149 |
| Quinidine | 10,100,000 Av Oz | 1,800,462 |
| Quinine | 4,500,000 Av Oz | 3,246,164 |
| Rubber | 864,000 MT | 120,508 |
| Rutile | 106,000 SDT | 39,186 |
| Sapphire & Ruby | 0 KT | 16,305,502 |
| Silicon Carbide, Crude | 29,000 ST | 80,550 |
| Silver (fine) | 0 TrOz | 139,500,000 |
| Talc, Steatite Block & Lump | 28 ST | 1,092 |
| Tantalum Group | 7,160,000 LB Ta Metal | 2,391,940 |
| (Tantalum Carbide Powder) | 0 LB Ta | 28,688 |
| (Tantalum Metal) | 0 LB Ta | 201,133 |
| (Tantalum Minerals) | 8,400,000 LB Ta | 2,551,302 |
| Thorium Nitrate | 600,000 LB | 7,131,812 |
| Tin | 42,700 MT | 201,535 |
| Titanium Sponge | 195,000 ST | 32,331 |
| Tungsten Group | 50,666,000 LB W Metal | 80,047,625 |
| (Tungsten Carbide Powder) | 2,000,000 LB W | 2,032,942 |
| (Tungsten, Ferro) | 0 LB W | 2,025,361 |
| (Tungsten Metal Powder) | 1,600,000 LB W | 1,898,911 |
| (Tungsten Ores & Concentrates) | 55,450,000 LB W | 87,062,763 |
| Vanadium Group | 8,700 ST V Metal | 541 |
| (Vanadium, Ferro) | 1,000 ST V | 0 |
| (Vanadium Pentoxide) | 7,700 ST V | 541 |
| Vegetable Tannin Extract, Chesnut | 5,000 LT | 16,393 |
| Vegetable Tannin Extract, Quebracho | 28,000 LT | 140,810 |
| Vegetable Tannin Extract, Wattle | 15,000 LT | 16,399 |
| Zinc | 1,425,000 ST | 376,310 |

Source: FEMA

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BUYING MATERIALS FOR STOCKPILE

Mr. YATES. Why have we not been buying then?

Dr. MORGAN. Well, we have been buying a little bit, but the total deficit for the 93 materials in the stockpile would be $12 billion. If I may say so, sir, the Congress made available for fiscal year 1982, the current year, $60 million.

Mr. YATES. That does not buy very much, does it?

Dr. MORGAN. At that rate, sir, it would take 200 years to complete the strategic stockpile.

Mr. YATES. Neither you or I will be here to look at the charts.

Dr. MORGAN. Well, I hope——

Mr. YATES. You hope there is a better result. What is in the budget this year to do the buying?

Dr. MORGAN. The President is asking for $120 million in fiscal 1983.

Mr. YATES. We have heard a tremendous outcry of alarm due to the condition of our national stockpile and our dependence on importing from other countries.

Why are we not spending more money to buy these deficit materials?

Dr. MORGAN. Well, the President, sir, in his mineral policy statement——

Mr. YATES. Yes, I know, he said——

Dr. MORGAN. That just came out, the April 5th statement, stressed that we will do several things. One is that we are going to acquire materials for the stockpile, not only through cash appropriations, but also by barter and exchange of surplus Government materials. So that would bypass some of the appropriations process.

We are also increasing the availability of the public lands which should stimulate exploration for and development of some of these materials. Also, the President's Economic Tax Recovery Act is intended to stimulate domestic industry investment, which for some materials should improve our position.

Also we are removing burdensome environmental regulations which have inhibited the development of some mining and smelting in this country.

Mr. YATES. In previous years——

Dr. MORGAN. It is not just buying for the stockpile, it is a combination.

Mr. YATES. Are prices not low for some of these commodities now?

Dr. MORGAN. Yes, sir, prices are lower now than they have ever been before. Considering that last year there was 10 percent inflation, when you look at aluminum which is 76 today and was 76 a year ago, it is now cheaper than a year ago.

Copper a year ago was 86, today it is 74.

Mr. YATES. 74 what?

Dr. MORGAN. 74 cents a pound. Copper scrap a year ago was 69 cents, today it is 53.

Lead a year ago was 38, today it is 26 cents a pound.

Nickel was $3.50 a year ago, today it is $2.30.

Mr. **Yates**. We are buying oil for the Strategic Petroleum Reserve, why should we not buy these metals for stockpile? Who does the buying, the Department of Defense?

Dr. **Morgan**. The General Services Administration, sir, under direction from the Federal Emergency Management Agency, FEMA.

Mr. **Yates**. Has FEMA indicated that we ought to be increasing the amounts in the stockpile?

Dr. **Morgan**. Certainly. We were before the Senate Banking Committee just the other day, General Giuffrida, the head of FEMA, was there and I had the privilege of testifying for the Interior Department. The Defense Department was there and the Commerce Department.

We all testified in favor of the stockpile and in particular, sir, we testified in favor of the extension of the Defense Production Act because the President has recommended a 5-year extension of the Defense Production Act. That act gives us the authority for priorities and allocations, supply expansion, and voluntary agreements with industry, all of which would be required if a problem came up and if we had to deal with strategic materials in short supply.

So I want to emphasize that we have a broad spectrum of tools to deal with shortage situations.

### BUDGET REQUEST FOR STOCKPILE PURCHASES

Mr. **Yates**. We have a spectrum of tools but no money in the budget except $100 million dollars?

Dr. **Morgan**. The President is asking for $120 million.

Mr. **Yates**. How many years will it take to develop the stockpile if we use the tools that are recommended by opening the mines, cutting down the air and water standards that are now in the law, resorting to barter, and the other suggestions that you made? It is going to take a lot longer than just going out in the market and buying them, is it not?

Dr. **Morgan**. Yes, sir. You, sir, have a long memory, and I do too. Possibly you are remembering that in the period prior to the Korean War we had air superiority, nuclear superiority, naval superiority and when nearly all of Africa was under European control and nearly all of Latin America was tied closely to the U.S., the Berlin Blocade started in 1948 and the Congress in one year following appropriated over $1.3 billion for stockpiling.

So there were times in the past when there were greater appropriations.

Mr. **Yates**. You say that we sold $4 billion worth of materials from the stockpile.

Can you give us a list of those materials and when the sales took place?

Dr. **Morgan**. Yes, sir. The bulk of the sales was in 1973, 1974, 1975, and we will provide a list.

[The information follows:]

## Meaning of Quantity Symbols

(For use with Table 1. FEMA's Stockpile Goals and Table 2. Surplus Strategic and Critical and Other Materials Sold by GSA.)

ST = short tons
SDT = short dry tons
LT = long tons
LDT = long dry tons
LCT = long calcined tons
MT = metric tons
LB = pounds
AV LB = avoirdupois pound
AMA LB = anhydrous morphine alkaloid pound
OZ = ounces
AV OZ = avoirdupois ounces
TR OZ = troy ounces
KT = carats
FL = flasks (76 lb)
PC = pieces

## STOCKPILE GOALS AND INVENTORIES

Mr. **Yates**. Those materials that were sold continue to be in deficit today, and now we are looking to replenish those supplies for the stockpile?

Dr. **Morgan**. That is correct.

Mr. **Yates**. Well, is the information classified? Can you tell this committee what the new FEMA goals are?

Dr. **Morgan**. Yes, sir. Table 1 lists the goals for the 93 materials and the inventory on hand.

Mr. **Yates**. How much do you estimate it would cost to move all the stockpile materials to their recommended levels, at today's prices?

Dr. **Morgan**. For the total number that are in the red, it would take $12 billion.

Mr. **Yates**. $12 billion to get ourselves out of the red.

Dr. **Morgan**. To achieve all goals for the 93 items would take $12 billion.

Mr. **Yates**. Towards that purpose, we are proposing to expend $120 million?

Dr. **Morgan**. Yes, sir.

Now in addition, there are $4 to $5 billion of excess materials in the stockpiles. The President has recommended that the excesses be sold off, that the money from the sale of the excesses go into the revolving fund established by the 1979 Stockpiling Act, and the money then be used to purchase other materials, which makes real sense.

However, one of the biggest items which is excess is silver. There are 139 million ounces of silver in the stockpile which have been declared excess, and the Congress initially approved a 3-year silver disposal schedule which, however, they halted in December, asking the President to make a study of the 10-year future silver supply-demand situation before any silver could be sold.

Mr. **Yates**. How much money is represented by this excess?

Dr. **Morgan**. The 139 million ounces at about $7 an ounce would be $1 billion right there.

Mr. **Yates**. Why did Congress, in its wisdom, do that?

Dr. **Morgan**. Well, some Congressmen, sir, sincerely wondered if the Government were not making a mistake selling off the silver as we had in selling off a number of commodities in years before.

Mr. **Yates**. On page 566, of last year's hearing record, Mr. Yates says, "I have seen this chart before. There are only two on your chart which reached 100 percent." We have the same situation this year. "If copper is low in price, why do we not buy it and put it in the stockpile so we have our 100 percent stockpile."

A very logical question, by Mr. Yates, I would say, would you not?

Dr. **Morgan**. Yes, sir.

Mr. **Yates**. Dr. Morgan replied, "The value of all the goals for the 93 materials, if you price the 93 out at the present price, would require $20 billion."

Dr. **Morgan**. Correct.

Mr. **Yates**. Now you are saying it is $12 billion.

Dr. MORGAN. The deficit would be $12 billion. The value of all 93 materials is $20 billion, the number is the same. There is eight——

Mr. YATES. Why would the number be the same if the prices have gone down?

Dr. MORGAN. When you round off it is not that much of a change.

Mr. YATES. Okay.

Dr. MORGAN. Let me make it clear if I can.

The total value of the goals for 93 materials is $20 billion.

On-hand towards the goals is $8 billion. The deficit then is $12 billion. On-hand excess to the goals is about $5 billion, which could be sold.

Mr. YATES. That is exactly what you told us last year.

Mr. Murtha, in addition to what you stockpiled now.

Dr. MORGAN. There are $8 billion on hand toward the goals.

Mr. YATES. It could take $12 billion more.

Dr. MORGAN. Yes, sir, it would take $12 billion more. There are materials excess to the goal valued at $5 billion, therefore you could turn around and sell the $5 billion, then you would need additional financing of $7 billion.

While we senior civil servants fully support the President's budget, the history of the budget is not encouraging because the last President asked for $150 million, the House cut it to $100 million, and the Senate Committee cut it to $50 million.

Therefore, if you look at a shortage on the order of $12 billion, and you look at a budget on the order of 50 or 100 million, it would take 240 or 120 years to complete the stockpile.

I wonder if we looked at your testimony the year before this for fiscal 1981, would we find the same answers?

Dr. MORGAN. Sir, the situation has been very much the same for several years.

Mr. YATES. How important is it that we take remedial steps?

Dr. MORGAN. Well, sir, President Reagan said in his statement of April 5th which I would be happy to submit if you would care to have it in the record.

Mr. YATES. We will put it in the record.

[The information follows:]

# LETTER OF TRANSMITTAL

*To the Congress of the United States:*

I am pleased to submit the National Materials and Minerals Program Plan and Report to Congress, pursuant to the National Materials and Minerals Policy, Research and Development Act of 1980.

This national minerals policy recognizes:

- the critical role of minerals to our economy, national defense, and standard of living;
- the vast, unknown and untapped mineral wealth of America and the need to keep the public's land open to appropriate mineral exploration and development;
- the critical role of government in alerting the Nation to minerals issues and in ensuring that national decision-makers take into account the impact of their decisions on minerals policy; and,
- the need for long-term, high potential payoff research activity of wide generic application to improve and augment domestically available materials.

This policy is responsive to America's need for measures to diminish minerals vulnerablilty by allowing private enterprise to preserve and expand our minerals and materials economy.

RONALD REAGAN

THE WHITE HOUSE, April 5, 1982.

# NATIONAL MATERIALS AND MINERALS PROGRAM PLAN AND REPORT TO CONGRESS

## INTRODUCTION

During the 1980 campaign, I expressed to the American people my deep concern regarding the increasing dependence of the United States and the free world upon foreign sources for strategic and critical minerals. I raised concerns regarding the state of the materials stockpile as well as government policies which have inhibited and hindered the ability of Americans to produce and supply these vital resources. I established a Strategic Minerals Task Force, which subsequently reported to me, suggesting administrative and legislative actions to address these important questions.

On March 13, 1981, I called for the expenditure of $100 million for the first major additions to the stockpile in over twenty years. $78 million went to purchase cobalt, a material which was then at less than 50 percent of our stockpile goals. At that time I indicated that I would take further action regarding strategic minerals.

I hereby transmit to the Congress my recommendations and a report on the activities to be undertaken by this Administration to reduce America's materials vulnerability. These actions do not represent, nor should they be interpreted as, the total solution to America's minerals and materials problems. Nor should all import dependence be interpreted as vulnerability. Rather, these steps will begin to focus the attention of the nation on those specific mineral availability and processing problems that are posed to our economy and our national security by dependence on insecure sources where useable substitutes are not readily available. These actions represent a serious concern and commitment, the first such Presidential commitment in nearly three decades.

On October 21, 1980, the National Materials and Minerals Policy, Research and Development Act of 1980 was signed into law. That Act mandated a report to the Congress regarding actions taken by the Administration to implement it. This report is presented in response to that mandate.

## STATEMENT OF POLICY

It is the policy of this Administration to decrease America's minerals vulnerability by taking positive action that will promote our national security, help ensure a healthy and vigorous economy, create American jobs, and protect America's natural resources and environment.

## LAND AVAILABILITY

Large amounts of Federal land—estimates vary from 40 percent to 68 percent—are now closed to mineral exploration and development at a time when the nation has become increasingly dependent on foreign sources for many strategically important minerals.

Although these minerals are important to our civilization, our standard of living, and our defense, less than three-tenths of one percent of the nation has *ever* been disturbed by mining. Much of our public land is highly mineralized, but large amounts of that land now lie off limits to exploration and development.

Therefore, this Administration will continue to inventory Federal land to determine the mineral availability and potential of that land, while protecting the environment and preserving for future generations those natural resource areas set aside by law for special purposes. To achieve a proper balance between wilderness and mineral needs of the American people, the Administration will seek legislation to preserve wilderness lands, to release from continuing uncertainty nonwilderness lands for multiple use, to ensure the availability of information regarding the mineral potential of wilderness areas, and to permit a reexamination of national wilderness policy in the year 2000.

Because large amounts of Federal land have been withdrawn from mineral entry by obsolete and unnecessary Executive actions, this Administration will solicit from the public recommendations on public land to be made available for exploration and development, and will focus immediate attention on those areas. In addition, this Administration will accelerate the review of lands withdrawn from mineral exploration and revoke obsolete withdrawal orders, will continue a rapid withdrawal review program for Alaska lands, and will open to mining those lands withdrawn from operation of the General Mining Laws but which are open to operation of the leasing laws.

To ensure that minerals location is considered by the Congress in future Congressional withdrawals of lands; the Executive agencies will, when appropriate, prepare and present to the Congress strategic and critical minerals impact analyses as a part of this Administration's comments on proposed future withdrawals.

The Administration is also seeking to reduce our future dependence on potentially unstable foreign sources of minerals by eliminating barriers to the development of the mineral resources of the deep seabed.

Unfortunately, the current draft Law of the Sea Treaty would create a burdensome international regulatory regime that would in effect discourage, if not prevent, deep seabed mining. Therefore, as I announced on January 29, we are seeking major revisions in the draft treaty at the current United Nations Conference on the Law of the Sea, so that the draft treaty would encourage deep seabed mining and meet other basic U.S. national interests.

## MINERALS DATA

We recognize the critical role that minerals and materials play in our highly industrial economy, and the unpredictability of international events affecting the reliability of minerals supply. This Administration will therefore continue to collect minerals data and use it in monitoring trends and events affecting supply and demand. We will consult with other nations to improve the exchange of minerals information, and will do the same between Federal agencies and States, and between the public and private sectors.

## RESEARCH AND DEVELOPMENT

The favorable tax incentives in the Economic Recovery and Tax Act stimulate private research and development to ensure the availability of the materials essential to the nation's economy and national defense. Any government-financed research and development activities will concentrate on long-term, high-risk, high potential payoff projects with the best chance for wide generic application to materials problems and increased productivity. Mission-specific programs of the Department of Defense are an exception to this policy. Existing Federal programs are being assessed to ensure conformity to this policy.

## REGULATORY REFORM

The Administration will continue its review and reform of excessively burdensome or unnecessary regulations and statutes which adversely affect the domestic minerals industry. A summary of efforts to date is included as Appendix A.

## STOCKPILE POLICY

The security of America's foreign sources of materials can no longer be ignored. The United States imports more than half of our total supplies of twenty strategic materials. This Administration has undertaken the first stockpile purchase program in twenty years. We endorse the policy that the stockpile should be sufficient to meet military, industrial, and essential civilian needs in support of the national defense in a crisis.

To achieve this goal, the Administration will seek Congressional approval to sell the excess reserves of materials currently in the stockpile. We are seeking Congressional appropriations to acquire necessary stockpile materials. We will use exchanges and barter to acquire additional stockpile materials when in the best interest of the country.

We will direct a panel of experts to review the quality of materials in the stockpile and recommend such actions as may be necessary to ensure the quality of the stockpile. Finally, this Administration will rely primarily upon purchases on the open market to build the Nation's stockpile necessary for the national defense and national security.

## CABINET COUNCIL ON NATURAL RESOURCES AND ENVIRONMENT

Strategic and critical material issues concern many Federal departments and agencies. During the course of the Cabinet review, approximately twenty governmental bodies were involved in various aspects of the issue. There is a clear need for coordinated and focused attention to ensure the full and complete implementation of a national materials policy and the capability of the United States to address and respond to materials problems, particularly where the national security is concerned.

The involvement of numerous Federal agencies in the materials issue reflects both the breadth of the issue, not only in the government but in the economy, as well as the existence throughout government of statutorily assigned missions and responsibilities which relate to materials policy.

It is therefore the position of this Administration that national materials policy will be coordinated through the Cabinet Council on Natural Resources and Environment. This will ensure high level consideration of important materials policy issues on a timely basis with the capability of prompt action on such issues by the President. The Cabinet Council requires minimum administrative staff, relying for detailed analysis upon the various agencies and departments which have ultimate statutory responsibility for implementation.

# LAND AVAILABILITY

## BACKGROUND

Federal lands, totaling some 734 million acres, represent a vast, largely undeveloped storehouse of resources that are important to the nation's welfare. Among the most significant of these resources are minerals, particularly those of strategic importance to economic and national defense goals. Increasing amounts of Federal land have been closed to mineral exploration and development while dependence on foreign sources has grown and the security of supply from some areas has been questioned.

The use of Federal lands has been restricted for a variety of reasons by various mechanisms over a number of years. The majority of such restrictions have been imposed by Congressional action or formal Executive withdrawals, but there are also segregations of Federal land arising from administrative actions that amount to "de facto" withdrawals.

In 1980, the Bureau of Land Management promulgated surface management regulations which prevent undue degradation of public lands by mining activities. These regulations, authorized by the Federal Land Policy and Management Act (FLPMA), (similar regulations for national forests were promulgated by the U.S. Forest Service in 1974) make many of these past "protective" withdrawals unnecessary.

Until passage of FLPMA, authorities and administrative responsibility for Executive withdrawals were not clear, and among the consequences were a welter of overlapping withdrawals, lack of any central record of withdrawn lands, and an accumulation of obsolete or otherwise unnecessary withdrawals. FLPMA required a review of certain withdrawals, to be completed by 1991, revoking those that are not ". . . consistent with the statutory objectives of the programs." All types of withdrawals for other agencies, and withdrawals from mining and mineral leasing for national forests and land administered by the Bureau of Land Management, are to be reviewed.

New mineral deposits will not be found unless the private sector looks for them. It is to the nation's advantage to encourage this search. Government has a responsibility as owner of most of our better mineral lands to minimize unnecessary restrictions that limit that search. Economic use of our natural resources allows decisions to be based on full information of all values that are involved. Preservation of wilderness areas, for example, is an important goal that must be balanced against others, such as the national security.

## ISSUES AND ACTIONS

1. Under the terms of the Wilderness Act of 1964, significant Federal acreage (about 13 percent of all withdrawn lands) will become permanently inaccessible for mineral exploration and development, subject to valid existing rights, on January 1, 1984. While wilderness land is now open to leasing, virtually no leasing has been permitted under the discretionary authority provided. In the 1964 Act, Congress clearly intended to permit exploration of wilderness areas in the time provided. However, because of past bureaucratic resistance and the uncertainty of obtaining permission to develop, exploration has not occurred, even though minable deposits are known to exist in some areas and there are significant chances for discovery in others.

The Administration will seek legislation to withdraw from mineral appropriation and leasing all wilderness and wilderness study areas pending Executive or Congressional action until the year 2000. The legislation will permit the continuation of energy and mineral exploration activities that ensure the protection of the land values. The legislation will permit development of wilderness lands during a period of national emergency, upon a finding by the President of urgent national need. Also, the Department of the Interior will report to the Congress every five years regarding the energy and mineral potential of wilderness and wilderness study areas and the resource opportunities foregone, permitting an informed reexamination of national wilderness policy during the 106th Congress. The Administration will seek a limitation upon the period of time that public lands may be withheld as wilderness study areas, setting dates after which time, without Congressional action, those lands would revert to multiple use.

2. An unknown amount of Federal land is removed from entry by obsolete or otherwise unnecessary withdrawals. The Federal Land Policy and Management Act allows fifteen years to review previous withdrawals. Additionally, an estimated 5.6 million acres of Federal land are closed to mineral exploration by Federal applications for withdrawal which pre-date the Federal Land Policy and Management Act. The law allows these segregations to remain in effect until 1991, while new applications can segregate lands for only two years.

Millions of acres of Federal lands (from 10 to 60 million acres) are open to leasing but closed to operations under the Mining Law, which suggests that controlled mineral activity may not be inconsistent with the purpose of the withdrawals. When review is conducted, it may fail to focus on the highest priority lands, that is, those most likely to have important mineral deposits. Additionally, administrative processing of revocations is inefficient, and there is a general lack of current, accurate information on Federal land status.

The Administration will issue an invitation to the public to nominate areas of high mineral interest and use those nominations to identify "Areas of Critical Mineral Potential" as an overlay of existing land use designation in selected areas for priority withdrawal review.

The Administration will take other steps to stimulate land availability:

a. There will be an acceleration of withdrawal reviews now scheduled to be completed by the end of FY 1991.

b. All Federal agencies will perfect pre-Federal Land Policy and Management Act withdrawal applications as soon as possible; segregation of those lands will then end, absent a withdrawal order.

c. We will open to operation of the General Mining Laws those lands now withdrawn by Executive or Secretarial Order, but which are open to operation of the leasing laws; but Congressional and military withdrawals would not be affected.

d. All Federal agencies will inform promptly, and consult with, the Interior Secretary prior to any new withdrawal.

The Administration will issue "blanket" revocations for certain categories of withdrawals citing public land orders that withdrew such lands, thus saving administrative work-years and *Federal Register* publication costs while revoking an estimated 400 separate outdated withdrawals.

The Administration, in commenting on future land withdrawals, will, where appropriate, prepare and submit to Congress strategic and critical minerals impact statements to ensure informed Congressional decisionmaking. Additionally, in the annual report required by the Mining and Minerals Policy Act of 1970, the Administration will provide to the Congress a strategic and critical minerals estimate of the amount of Federal land which is administratively withdrawn from operation of the General Mining Laws, and ask Congress to consider carefully the potential impact on America's mineral needs of designating more lands for withdrawn status.

3. There has been a series of reports in recent years deploring the lack of current, accurate information regarding Federal land status and, more particularly, the availability of that land for mineral exploration. While special surveys, such as those conducted by the Office of Technology Assessment, Bennethum and Lee, and the Department of the Interior, provide some understanding of land availability and thereby some policy guidance for land use decisions in both the Executive and Legislative Branches, that information quickly becomes outdated. Thus, if the specifics of land availability are to provide the background for land use decisions, there exists a need for a system revealing the degree of availability.

The Administration will examine the state and quality of Federal land use data and the systems available for improving the inventorying and cataloging of the status of Federal land.

Table 2. SURPLUS STRATEGIC AND CRITICAL AND OTHER MATERIALS SOLD BY GSA 1973-4-5-6 (Source: FEMA, 5 May 1982)

| | Quantity (Thousands) | Dollars (Millions) | | Quantity (Thousands) | Dollars (Millions) |
|---|---|---|---|---|---|
| Aluminum | 1,283 ST | 704 | Mica, Muscovite Block | 8,406 LB | 6 |
| Aluminum Oxide, Fused, Crude | 120 ST | 15 | " , Muscovite Film | 262 LB | 0.5 |
| Antimony | 6 ST | 8 | " , Muscovite Splittings | 12,758 LB | 5 |
| Asbestos, Amosite | 16 ST | 4 | " , Phlogopite, Block | 26 LB | 0.02 |
| " , Chrysotile | 0.9 ST | 0.4 | " , Phlogopite, Splittings | 1,262 LB | 0.9 |
| " , Crocidolite | 18 ST | 4 | Molybdenum Disulphide | 22,843 LB | 39 |
| Bauxite, Metallurgical | 781 LDT | 4 | Molybdenum, Ferro | 7,496 LB | 16 |
| Cadmium | 2,387 LB | 11 | Molybdic Oxide | 10,958 LB | 20 |
| Castor Oil | 10,160 LB | 5 | Opium, Gum | 65 AVLB | 8 |
| Celestite | 12 SDT | 0.4 | Platinum Group, Iridium | 0.2 TROZ | 0.07 |
| Chromite, Chemical | 323 SDT | 6 | Quartz Crystals | 1,230 LB | 7 |
| " , Refractory | 762 SDT | 18 | Quinine | 300 OZ | 0.8 |
| " , Metallurgical | 940 SDT | 6 | Rare Earths | 4 SDT | 3 |
| Chromium, Metal | 4 ST | 11 | Rubber | 136 LT | 106 |
| Cobalt | 27,371 LB | 90 | Rutile | 17 SDT | 4 |
| Columbium, Ores and Concentrates | 3,207 LB | 7 | Selenium | 459 LB | 6 |
| " , Ferro | 458 LB | 1 | Shellac | 2,825 LB | 2 |
| " , Oxide, Powder | 86 LB | 0.2 | Silicon Carbide, Crude | 115 ST | 33 |
| Copper | 252 ST | 449 | Sperm Oil | 23,384 LB | 4 |
| Cordage Fibres, Abaca | 32,462 LB | 12 | Talc, Steatite, Block | 0.6 ST | 0.02 |
| " , Sisal | 112,785 LB | 18 | Tantalum, Minerals | 685 LB | 9 |
| Diamond, Industrial Bort | 10,283 KT | 23 | Thorium Nitrate | 377 LB | 0.7 |
| " , Industrial Stones | 3,402 KT | 42 | Tin | 47 LT | 333 |
| Feathers and Down | 2,547 LB | 10 | Titanium | 9 ST | 20 |
| Kyanite-Mullite | 2 SDT | 0.2 | Tungsten, Ferro | 115 LB | 0.7 |
| Lead | 474 ST | 169 | Tungsten, Metal Powder | 294 LB | 1 |
| Lithium | 9,787 LB | 6 | Tungsten, Ores and Concentrates | 15,417 LB | 78 |
| Magnesium | 88 ST | 60 | Vanadium | 1 ST | 9 |
| Manganese, Battery Grade, Synthetic | 13 SDT | 5 | Vegetable Tannins, Chesnut | 3 LT | 0.9 |
| " , Battery Grade, Natural | 44 SDT | 3 | " , Quebracho | 19 LT | 7 |
| " , Chemical | 27 SDT | 2 | " , Wattle | 14 LT | 5 |
| " , Metallurgical | 3,737 SDT | 94 | Zinc | 531 ST | 277 |
| " , Ferro, High-Carbon | 576 ST | 101 | Zirconium Ore, Baddeleyite | 16 SDT | 0.04 |
| " , Electrolytic | 7 ST | 6 | Zirconium Metal Powder | 2 LB | 0.001 |
| Mercury | 6 FL | 1 | Diamond Tools | 11 PC | 0.04 |
| | | | Gold | 1,254 TROZ | 155 |
| | | | TOTAL (rounded) | | 3,054. |

# MATERIALS RESEARCH AND DEVELOPMENT

## INTRODUCTION

Mineral resources, the basis of materials supply, are vital to defense and to a healthy economy. The entire materials cycle is a fundamental component of economic production and technological innovation. Technological innovation has always played a major role in meeting the problems of materials supply.

It is generally agreed that the United States has recently been exhibiting a lowered rate of productivity growth, and that an increased pace of technological innovation is needed. In many cases America's ability to compete with other nations in the world marketplace has been reduced because productivity has lagged behind wages, which has also contributed to inflation. As a result, the domestic minerals industry is no longer as advanced in mineral processing technology as many of America's foreign competitors.

## GOVERNMENT'S ROLE

Since business enterprise is the primary engine of technological change, the driving force behind technological innovation through research and development is the expectation of a satisfactory return on invested capital. If there are circumstances, either real or perceived, which increase cost, increase the time to commercialization, increase risk or otherwise reduce the return on investment, innovation will be discouraged. Thus the first and perhaps most important requirement for materials research and development is the existence of a favorable business and political climate which encourages both the initiation of the innovative process (financing research and development activities) and the undertaking of steps leading to commercialization (applied research and development).

A critical element of materials research and development activities, and an area of traditional government support, is the basic research necessary to the development of a scientific data base. This requires close coordination between agency programs addressing supply problems and those addressing materials manufacture and performance.

In addition, government intervention in, and assistance of, technological development is appropriate only where market forces are incapable of achieving clearly defined national objectives. Thus government's attention regarding research and development activity should focus on long-term, high-risk potentially high-payoff technology that has the best chance for wide generic application.

To fulfill this role, the Administration will:

1. Create a business and political climate which will encourage private sector research and development;

2. Stimulate constructive coordination between industry and government in the area of technological innovation; and

3. Focus and direct other government financed research and development activities on long-term, high-risk technology with the best chance for wide generic application to materials problems.

## REGULATORY REFORM

As part of its effort to eliminate excessive and unnecessary regulations, the Administration will initiate an inquiry into Federal regulatory policies that discourage private materials research and development activities.

## GOVERNMENT-INDUSTRY COORDINATION

The Administration will, through the Office of Science and Technology Policy in concert with each department and agency with a significant materials research and development program, direct senior officials to maintain or create effective mechanisms for constructive coordination of mineral and materials research and development. This will include both basic research and current government programs of materials substitution research.

## INTERNATIONAL RESEARCH AND DEVELOPMENT

The Administration will formally establish contacts with the European Communities and other free world countries for exchange of information on materials research and development activities.

## IDCA TRADE AND DEVELOPMENT PROGRAM

The Trade and Development Program (TDP) of the International Development Cooperation Agency (IDCA) is giving new emphasis to strategic minerals and metal-related development activities, in accordance with its legislative mandate. This will broaden opportunities for the U.S. private sector to participate in the development and diversification of foreign sources of supply of strategic and critical materials.

## INTRAGOVERNMENTAL COORDINATION

The Administration reaffirms the Committee on Materials (COMAT), under the direction of the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET) for the coordination of Federal materials and minerals research and development activities, directing:

1. Assistant Secretary-level representation from the departments and agencies concerned with minerals and materials;

2. Placement within COMAT of the Department of Defense Material Availability Steering Committee and the Interagency Materials Group.

3. Establishment of a Working Panel within COMAT to coordinate Federal research and development on essential materials;

4. Establishment of a formal mechanism within COMAT for information exchange between agency materials research and development program managers; and,

5. Policy resolution of materials research and development questions will be provided through the Cabinet Council on Natural Resources and Environment.

# MINERALS AND MATERIALS DATA COLLECTION

## INTRODUCTION

Increasing U.S. reliance upon foreign sources for minerals, especially those vital to a modern defense system, the unpredictability of events that could affect the reliability of mineral supplies, and the expanding role of governments in determining the flow of minerals in international trade, require that policy makers have access to adequate information and analytical systems. While a number of Federal agencies have long acquired, maintained and analyzed such data, the coverage, quality and reliability of foreign data, and the inadequate coordination of domestic data, have limited its usefulness.

The importance of mineral information has been consistently identified by every major mineral policy study commissioned by the Federal Government in the last thirty years. These studies and others have also urged better analytical capability to improve the integration of mineral concerns into the policy process.

Worldwide, it is generally agreed that the statistical reporting of minerals information by the U.S. Government is unsurpassed. Nonetheless, the complexities of other national goals which may conflict with future domestic productive capacity require improvements in data collection and analytic support. Similarly, the complexities of problems that can affect the flow of minerals in international trade, an essential element of U.S. supply, require a better understanding of the data and the impacts of policy options.

Mineral information and analysis can provide guidance on policies affecting the strategic stockpile, land use, tax and tariff, trade, investment, research and development, environmental protection, and other aspects of domestic and foreign policies.

## FOREIGN MINERALS DATA AND ANALYSIS

The Administration will strengthen the Regional Resource Officer (RRO) program. The Department of the Interior will establish a formal minerals training program for all State Department personnel assigned to RRO positions, with emphasis on mining and minerals processing, marketing arrangements, and minerals policies.

The Administration will initiate discussions designed to improve the exchange of policy-oriented minerals information among market economy countries, to encourage the exchange of information on mineral investment problems, to improve the consistency of statistical reporting, and to consult on issues relating to selected strategic minerals.

## DOMESTIC MINERALS DATA AND ANALYSIS

The role of the Federal Government in collecting and interpreting minerals data is recognized. While there has been some debate on whether too much or not enough data is being reported, industry has consistently urged full reporting of quantitative supply demand data. As owner of one-third of the nation's lands, as purchaser and seller of raw materials for stockpile programs, and as law-maker affecting trade, tax, investment and environmental policies, the government has a major impact on all levels of exploration and developoment as well as on the overall health of the mining industry.

The Administration will seek increased and improved cooperation from the private sector in responding to minerals and materials data requests.

The fragmentation of minerals/material data among many agencies of the Federal Government may inhibit location, access, and exchange of data necessary for analysis and decisionmaking. The Administration will examine the United States Government's minerals and materials data system, ensuring the full participation of all affected departments and agencies. The review will:

1. Identify possible data gaps, duplications, inconsistencies, and redundancies;

2. Ascertain the adequacy of minerals and materials analysis;

3. Explore the benefits and costs of a National Minerals Information Center within the Federal Government as a central repository for material and mineral reports and information;

4. Develop a means of providing adequate protection for proprietary and classified data; and,

5. Develop a mechanism for regular briefings regarding minerals problems to the Cabinet Council on Natural Resources and Environment.

# STRATEGIC AND CRITICAL MATERIALS STOCKPILE

## OVERVIEW

### INTRODUCTION

The United States must implement materials and minerals policy programs to ensure that America's capacity to field and sustain fighting forces in the event of war or national emergency is not curtailed by a shortage of critical raw materials. To ensure that capability, this Administration is initiating a major interdepartmental effort to improve the nation's preparedness for national mobilization.

This review will address, among other issues, potential national security impacts of shortages of strategic and critical materials. This comprehensive approach will lead to the most efficient use of national resources in the event of a national crisis, including protracted conflicts and will be coordinated at the highest levels of the Administration to ensure the vigorous pursuit of all essential elements to restore a strong and lasting foundation for national security. This comprehensive approach to revitalizing our nation's mobilization capability represents the most concerted high-level effort in the past twenty-five years. Preparedness in the area of materials and minerals availability is an important part of this effort.

### EMERGENCY MOBILIZATION PREPAREDNESS BOARD

The people, government and economy of the nation must be prepared to work in concert to respond rapidly and effectively to meet national needs in the event of major peacetime and wartime emergencies.

President Reagan, to ensure this capability, established the Emergency Mobilization Preparedness Board (EMPB) on December 17, 1981.

The EMPB consists of the representatives of 23 key Federal departments, agencies, and executive offices at the Deputy or Under Secretary level, normally meeting quarterly. The Chairman of the Board is the Assistant to the President for National Security Affairs.

The Board is tasked to develop overall policy and a plan of action that will immediately improve the nation's preparedness capabilities. As an additional task, the Board is responsible for monitoring Federal agency implementation of these actions.

The Board has authority to resolve mobilization preparedness issues within the framework of current Administration policy.

The Board will perform the following functions:

1. Formulation of recommendations concerning policy for emergency mobilization preparedness.

2. Development of policy guidance documents for working groups and agencies to implement approved policies and plans of action.

3. Resolution of mobilization preparedness issues within the framework of current Administration policy.

## NATIONAL DEFENSE AND CRITICAL MATERIALS

To fulfill our basic national security objectives, the U.S. must be prepared to marshal the military and industrial resources to sustain an adequate war-fighting capability. An integral part of this effort is an enhanced industrial mobilization capability to sustain and resupply our military forces through protracted conflict. We must assure the responsiveness and staying power of the industrial base.

A crucial aspect of any industrial mobilization capability is a secure, reliable, and sufficient supply of critical raw and processed materials. The United States and its allies are heavily reliant on imports of certain critical raw and processed materials. Thus, a long-term supply interruption could have serious consequences for U.S. and allied security by disrupting capabilities to produce military and essential civilian goods either in a declared national emergency or wartime mobilization.

## STATUTORY AUTHORITY

As a result of the national defense and security requirement for a secure and reliable supply of critical raw materials, the Congress has provided the President with comprehensive legislative authorities to meet these defense and national security needs, including the Strategic and Critical Materials Stock Piling Act (SPA), as amended, and the Defense Production Act (DPA) of 1950, as amended. The SPA authorizes the National Defense Stockpile of strategic and critical materials. Title I of the DPA authorizes the use of priorities in fulfilling contracts for goods and services, and controlled allocation of critical materials, when necessary to meet the needs of national defense. Title III of the DPA authorizes the use of a variety of incentives to expand production capacity and supply to meet national defense needs.

## DEFENSE PRODUCTION ACT

The priorities and allocations program which implements the authorities of Title I of the Defense Production Act has been a key tool for mobilizing industrial resources in support of current military programs or expanded defense requirements in an emergency period since 1950. It is used to schedule production to assure timely delivery today and is capable of adapting to future materials shortages or cut-offs. Historically, the system has been tested by shortages of such materials as cobalt, copper, nickel, steel, and titanium, resulting from strikes, war, natural disasters, international politics, and economic conditions. It can, however, only apportion materials within the United States.

## KEY ELEMENTS OF THE DEFENSE MATERIALS SYSTEM AND DEFENSE PRIORITIES SYSTEM (DMS/DPS)

The DMS/DPS serves a dual purpose: it provides the means for exercising the priority and allocation authorities of the President for the purpose of promoting the national defense or maximizing domestic energy supplies; and it provides a system which can be promptly expanded to direct the industrial sector of the economy to meet the exigencies of any emergency. The

DMS DPS is a flexible system which can be promptly adapted to special problems, particularly with respect to critical materials. Set-asides, specified minimum order quantities, and specified order lead times are effective tools to assure the equitable distribution of rated orders among all producers and suppliers, and assure timely delivery to defense programs. This assurance allows more effective handling of commercial business by providing producers with information as to the limits of their rated obligations. Other instruments, such as special priorities assistance, also can be effective in assuring timely delivery of materials in tight supply.

## ACTION

The Administration is committed to increased effectiveness of this system through better understanding by government and industry of the principles and advantages of the system. The Department of Defense will continue to improve its educational program extending through the major commands to the acquisition staffs, including contract administration, and its defense contractors. The Department of Commerce (Office of Industrial Resource Administration) in cooperation with Defense, will coordinate with industry, and has already held 48 DMS/DPS training sessions during this Administration.

The Administration will improve the priorities and allocations system by simplifying the regulations. Toward this end, the Department of Commerce in June 1981 published in the *Federal Register* a proposed revision of the Defense Priorities and Allocations System (DPAS) Regulation.

# THE NATIONAL DEFENSE STOCKPILE

## INTRODUCTION

The Strategic and Critical Material Stock Piling Act states the stockpile is ". . . to decrease and preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of (strategic and critical) materials in times of national emergency." The Act further provides that the stockpile ". . . should be sufficient to sustain the United States for a period of not less than 3 years in the event of a national emergency . . ." and ". . . is to serve the interest of national defense only and is not to be used for economic or budgetary purposes."

Stockpile goals are established by matching the requirements of military, essential civilian and basic industrial sectors in support of national defense for a three-year national emergency to an assumed level of secure supply of critical materials. The resultant shortfall determines the stockpile goal as of any given year. Figure 1 illustrates the current stockpile inventory as compared with 1980 goals. It is apparent that restructuring of the stockpile inventory is necessary because many of the materials in the stockpile are either in deficit of their goal or in excess of their goal, and some are possibly technically deficient since they were acquired as long ago as the 1950s.

To fill the 1980 goals at March 1981 prices would require purchase of additional materials valued at approximately $12.5 billion. The stockpile inventory currently contains $7.64 billion of needed materials. Excess materials are valued at approximately $4.92 billion for a total stockpile value of $12.56 billion.

As shown in figure 2, the 61 family groups and individual materials in the stockpile can be divided into two categories:

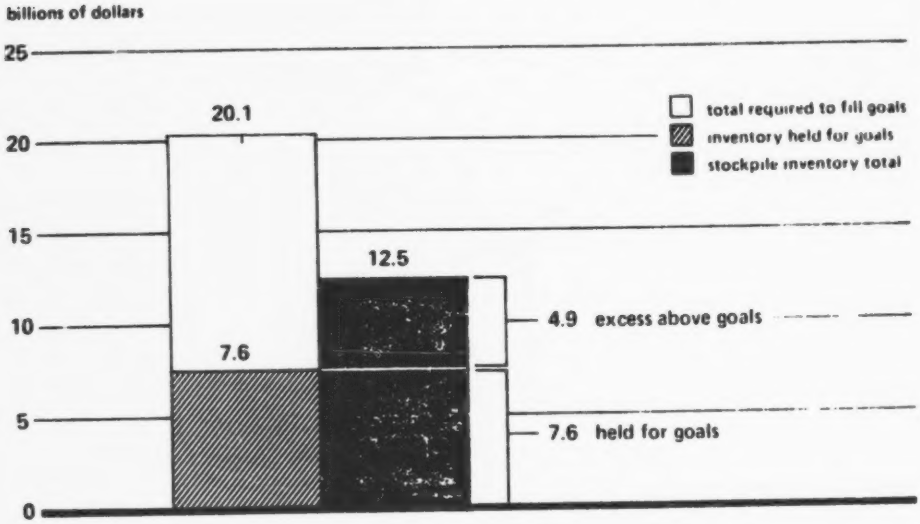

*Figure 1.—Restructuring of stockpile to meet 1980 goals.*

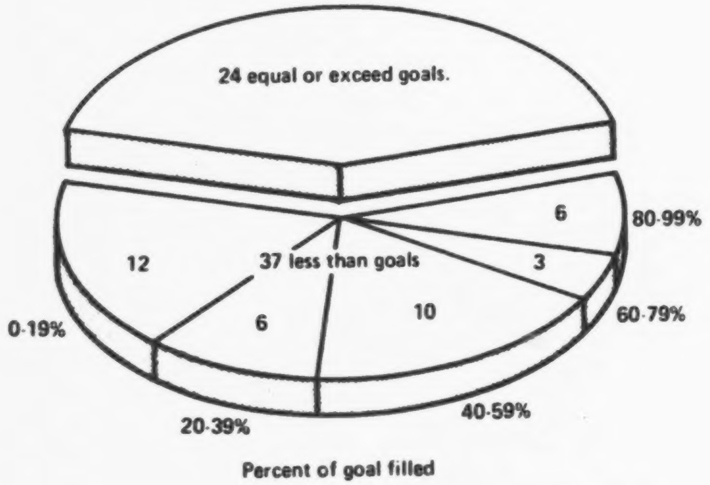

*Figure 2.—Status of the 61 family groups and individual materials in the stockpile inventory toward meeting the 1980 goals.*

24 groups and individual materials with inventory equal to or greater than the goals. (39%)

37 groups and individual materials with inventory less than the goal. Of these, the goals for 24 are less than 50% filled. (61%)

## PLANNING

Each year, an Annual Materials Plan (AMP) is established representing a major effort by several agencies under the direction of the Federal Emergency Management Agency to develop a list of materials for stockpile acquisition or disposal. National security requirements are balanced against market constraints and fund availability.

## RECENT ACTION

On March 13, 1981, President Reagan ordered the first major stockpile acquisition in twenty years. In FY 1981, the Congress provided $100 million for acquisiton, and the President requested an additional $106 million for FY 1982, which is currently limited by resolution to $57.6 million. In Appendix B is a detailed listing of the current status of the stockpile, material-by-material, including the estimated current market cost for filling the stockpile to 1980 goals, and potential receipts from selling excess commodities.

The Administration will streamline the AMP planning process by providing for:

1. Five-year planning guidance to form the basis for GSA acquisitions and disposals; and,

2. A fiscal year plan that matches annual budget ceilings, market conditions, immediate strategic requirements, and GSA purchase activities. In addition, GSA will chair a study group to determine whether there are inventory management deficiencies that can be corrected by measures such as rotation of stock and upgrading of storage sites.

## FURTHER ACTION.—STOCKPILE POLICY

The Administration continues to endorse the nation's stockpile policy. The key elements of the policy are:

1. That the stockpile should be sufficient to meet the military, industrial, and essential civilian needs for the first three years of a war. (Required by statute).

2. That the war scenario shall be consistent with the scenarios being developed by the Emergency Mobilization Preparedness Board chartered by Executive Memorandum dated December 17, 1981.

3. That goals reflect detailed assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and alternate foreign and domestic production levels for stockpile materials. (Assumptions were derived by a major interagency effort and endorsed by President Ford on August 6, 1976, and reaffirmed by Presidential letter dated October 10, 1977).

## PACE OF ACQUISITIONS

Whatever level of funding is chosen through the appropriation process, the decision should ensure long range planning to facilitate acquisition storage site selection, site preparation, and personnel strategies.

The Administration will expeditiously dispose of those stockpiled materials held in excess of goals and acquire additional materials through the appropriations process. Additional materials will be acquired in keeping with budgetary constraints and other national priorities.

This program demonstrates a serious commitment by this Administration to enhance significantly the national security.

Two additional mechanisms, exchange and barter, are authorized for acquiring material for the stockpile. The Administration will seek cases where these are more efficient and effective mechanisms than open market transactions.

As part of the Administration's plan to use all appropriate and cost-effective means to fill stockpile deficiencies, President Reagan directed FEMA, acting through GSA and USDA, on November 24, 1981, to procure 1.6 million tons of Jamaican type metal grade bauxite for the Defense Stockpile during FY 1982. This large and cost-effective acquisition program will be accomplished through a combination of direct cash purchase and exchange with excess materials from our stockpile by GSA, and barter using agricultural commodities with USDA. Agricultural barter to acquire needed raw materials will thus be used for the first time in almost fifteen years. This barter arrangement follows from the Congressional mandate contained in Section 6 of the Stockpiling Act of 1979.

## STATUS OF STOCKPILE INVENTORY—QUALITY AND FORM

In the past, questions have been raised about the quality of the stockpiled materials. In addition, the form in which material is held may not be ideal for current industrial use. Recently, steps were initiated to address the adequacy of the quality and the appropriate mix of alternative forms of existing materials.

Since the material in the stockpile is old, a careful review of the quality and form of stockpiled materials is in order. Therefore, this Administration will establish a panel, with appropriate private sector input, to review the extent of material deficiencies and to recommend remedial action, if needed. It should be noted that stockpile materials from past sales have been used with only minor difficulties.

## STOCKPILE ALTERNATIVES

The stockpile is designed to meet the needs of a three-year national emergency for materials not readily available from domestic sources. Consequently, each annual ton of new domestic production reduces stockpile requirements by three tons for as long as productive capacity is available.

The U.S. has a wide variety of mineral and material resources. There is significant U.S. production of such materials as aluminum metal, beryllium, copper, iodine, mercury, molybdenum, titanium, and lead. The U.S. also has potentially significant but undeveloped resources of non-bauxitic aluminum, cobalt, guayule (natural rubber), platinum, nickel, and titanium bearing materials. For a variety of reasons, the private sector has not found it profitable to invest in domestic production of certain critical materials. Several disincentives to investment will be significantly reduced by many of this Administration's initiatives regarding economic recovery, unnecessary regulations, streamlining procurement practices, and Federal land availability.

Title III of the Defense Production Act authorizes Federal loans at below market rates of interest, loan guarantees, price supports, and guaranteed purchase levels. While this authority was used successfully during the 1950s, it has not been used recently except for the appropriation of $3 billion in FY 1980 for the development of a synfuels capability.

This Administration will rely primarily on the strategic stockpile as the primary means of providing for national defense objectives. However, analysis is now ongoing to determine whether circumstances exist under which the use of Defense Production Act incentives would be more cost-effective than stockpile purchases.

## INTERNATIONAL MINERALS POLICY COORDINATION

Most industrial free market countries are more heavily dependent upon imported minerals than the United States (the two principal exceptions are Canada and Australia), but the United States is the only industrial nation with a significant stockpile of minerals and other critical materials for national defense. Other nations have investigated economic or strategic stockpiling of certain materials, but few programs have been carried out. Therefore, this Administration will initiate and conduct periodic and *ad hoc* consultation and coordination of the strategic and security policy aspects of non-fuel minerals and associated processing capabilities among industrial nations which are consumers of key materials.

We recognize our interest in policies which would create and maintain international markets for critical materials and the need of producing and consuming countries to cooperate to their mutual trade benefit.

## APPENDIX A

| Regulations | Need for Reform | Status* |
|---|---|---|
| | LAND ACCESS REGULATIONS | |
| Department of Commerce—NOAA: Deep Seabed Mining Regulations | Action accomplished. Promulgation of regulations removes uncertainty as to conditions for exploration. | Final rules for exploration licenses issued 9 15 81. |
| Advisory Council on Historic Preservation—Protection of Historic and Cultural Properties (30 CFR Parts 800) | Existing rules could be unnecessarily extensive and inflexible. | Revised rules under development by Advisory Council on Historic Preservation. |
| | SAFETY AND HEALTH REGULATIONS | |
| Department of Labor—MSHA: Mine Safety and Health Act of 1977 | The statute imposes some overly burdensome requirements. It is generally believed that statutory changes are necessary to provide relief. | Legislative alternatives are under review. |
| Department of Labor—MSHA: Metal/Nonmetal Safety and Health Standards (30 CFR Parts 55–57) | Many of the standards are ambiguous, outdated, duplicative, and disorganized. | Review in process: public conferences are being held. |
| Department of Labor—MSHA: Noise Standards (30 CFR Sections 57.5–50 and 70.500) | Noise standard needs to be revised to consider feasible and more effective alternatives to the present regulations. | Under review. |
| Department of Labor—MSHA: Civil Penalty Assessment Procedures (30 CFR Part 100) | More reasonable civil penalty regulations need to be developed. | Hearings have been held: still in rule making process. |
| Department of Labor—OSHA: Lead Standards | Means of abatement very costly. Review to focus on cost effective approaches. | ANPRM published 4 81. |
| Department of Labor—OSHA: Asbestos Standards | Reviewing scientific evidence on asbestos. | Under review. |
| | MISCELLANEOUS REGULATIONS | |
| Department of the Interior—BLM: Recordation of Unpatented Claims (43 CFR Part 3830) | Present regulations are claimed to impose excessive filing costs and harsh penalties for noncompliance. | Under review. |
| Department of the Interior—BLM: Preference Right Lease Application (43 Subpart 3521.1-1 et seq.) | Present requirements for preference right leases may delay development of valuable minerals. | Under review. |
| Department of the Interior—BLM: Public Land and Resources: Planning, Programming and Budgeting (43 CFR Part 1600) | Existing regulations may impede day-to-day administration of public lands and, consequently, mineral development. | Proposed rules published 11 81. |
| Department of the Interior—BLM: Areas of Critical Environmental Concern | Identification and designation of ACECs may be broader and more inclusive than envisioned under FLPMA, unnecessarily limiting access to resources. | Guidance being reconsidered. |
| Department of the Interior—FWS: Endangered Species Act Rules (50 CFR Chs. I and II) | Review is evaluating changes in statute, regulations, and management practices. | Under review by Presidential Task Force on Regulatory Relief. |
| Department of the Interior—FWS: Fish and Wildlife Coordination Act (50 CFR Part 410) | Review is evaluating changes in statute, as well as regulatory and management practices. | Under review by Presidential Task Force on Regulatory Relief. |

*Unless specifically noted, review is conducted by the designated agencies, at their initiative, subject to procedures described in Executive Order 12291.

## APPENDIX A

| Regulations | Need for Reform | Status* |
|---|---|---|
| ENVIRONMENTAL REGULATIONS | | |
| Corps of Engineers—Clean Water Act: Section 404 Dredge and Fill Permit | Review focuses on changes in statute, regulations, and practices necessary for more cost effective attainment of environment goals. | Under review by Presidential Task Force on Regulatory Relief. |
| Environmental Protection Agency—RCRA | Overly burdensome RCRA regulations could impose major costs on mining industry. | Congress ordered exemption of mining industry pending completion of three-year study. Study is now under review. |
| Environmental Protection Agency—Clean Water Act | Review will focus upon costs and water quality benefits of best available technology standard. | Act to be reauthorized in 1982. Standards presently under review. |
| The following EPA regulatory programs may be affected by the pending reauthorization of the Clean Air Act: | | |
| PSD—Fugitive Dust | Almost all western surface mines are constrained. | Appeal pending in U.S. Court of Appeals for District of Columbia. |
| Class I Visibility Protection Integral Vistas | Regulations could block surface mining within view of national parks or wilderness areas. | Under review |
| CAA Exemption for Nonferrous Smelters (Section 119) | Exemption expires 1/1/88. Could substantially increase control costs in 1988 and shut down some smelters. | Additional nonferrous smelter orders to carry beyond the two five-year postponements allowed by the present statute have been proposed. |
| National Ambient Air Quality Standards (particulates, $SO_2$) | Existing standards may be based on inadequate scientific data. | Under review |

* Unless specifically noted, review is conducted by the designated agencies, at their initiative, subject to procedures described in Executive Order 12291.

# APPENDIX B

National Defense Stockpile Policy Division
Federal Emergency Management Agency

Comparison of Inventory to FEMA Goals

| | Inventory March 81 (Units) | FEMA Goals (Units) | Excess or Deficit (Units) | Excess or Deficit ($1.000) | Value of Deficit ($1.000) | Value of Excess ($1.000) |
|---|---|---|---|---|---|---|
| **Alumina-ST** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aluminum-ST** | 1.733 | 700.000 | -698.267 | 1.061.301 | -1.061.301 | 0 |
| **Bauxite. Metal Grade. Jamaica-LDT** | 8.858.881 | 21.000.000 | -12.141.119 | -457.841 | 457.841 | 0 |
| **Bauxite. Metal Grad Surinam-LDT** | 5.299.596 | 6.100.000 | -800.404 | -32.408 | -32.408 | 0 |
| **Aluminum Oxide. Abrasive Grain-ST** | 50.786 | 0 | 50.786 | 58.912 | 0 | 58.912 |
| **Aluminum Oxide. Fused Crude-ST** | 249.867 | 0 | 249.867 | 64.965 | 0 | 64.965 |
| **Bauxite. Abrasive. Grade-LCT** | 0 | 750.000 | -750.000 | -95.250 | -95.250 | 0 |
| **Antimony-ST** | 40.729 | 36.000 | 4.729 | 18.916 | 0 | 18.916 |
| **Asbestos. Amosite-ST** | 42.533 | 17.000 | 25.533 | 13.175 | 0 | 13.175 |
| **Asbestos. Chrysotile ST** | 8.793 | 3.000 | 5.793 | 8.689 | 0 | 8.689 |
| **Bauxite. Refractory-LCT** | 174.599 | 1.400.000 | -1.225.401 | -306.350 | -306.350 | 0 |
| **Beryl Ore (11% BEO)-ST** | 17.987 | 18.000 | -13 | -16 | -16 | 0 |
| **Beryllium Copper Master Alloy-ST** | 7.387 | 7.900 | -513 | -5.181 | -5.181 | 0 |
| **Beryllium Metal ST** | 229 | 400 | -171 | -59.166 | -59.166 | 0 |
| **Bismuth-LB** | 2.081.298 | 2.200.000 | -118.702 | -297 | -297 | 0 |
| **Cadmium-LB** | 6.328.809 | 11.700.000 | -5.371.191 | -10.743 | -10.743 | 0 |
| **Castor Oil. Sebacic Acid-LB** | 5.009.697 | 22.000.000 | -16.990.303 | -7.985 | -7.985 | 0 |
| **Chromite. Chemical. SDT** | 242.414 | 675.000 | -432.586 | -25.509 | -25.509 | 0 |
| **Chromite. Metallurgical. SDT** | 1,956,824 | 3.200.000 | -1.243.176 | -159.126 | -159.126 | 0 |
| **Chromium. Ferro. High Carbon-ST** | 402.003 | 185.000 | 217.003 | 150.481 | 0 | 150.481 |
| **Chromium. Ferro. Low Carbon-ST** | 300.192 | 75.000 | 225.192 | 295.227 | 0 | 295.227 |
| **Chromium. Ferro. Silicon-ST** | 56.986 | 90.000 | -33.014 | -24.695 | -24.695 | 0 |
| **Chromium. Metal-ST** | 3.763 | 20.000 | -16.237 | -138.012 | -138.012 | 0 |
| **Chromite. Refractory Grade Ore-SDT** | 391.414 | 850.000 | -458.586 | -43.268 | -43.268 | 0 |
| **Cobalt-LB Co** | 40.802.393 | 85.400.000 | -44.597.607 | -1.114.940 | -1.114.940 | 0 |
| **Columbium Carbide Powder-LB Cb** | 21.372 | 100.000 | -78.628 | -2.218 | -2.218 | 0 |
| **Columbium Concentrates-LB Cb** | 911.239 | 5.600.000 | -4.688.761 | -67.097 | -67.097 | 0 |
| **Columbium. Ferro-LB Cb** | 598.410 | 0 | 598.410 | 3.764 | 0 | 3.764 |
| **Columbium. Metal-LB Cb** | 44.851 | 0 | 44.851 | 1.776 | 0 | 1.776 |
| **Copper-ST** | 28.444 | 1.000.000 | -971.556 | -1.915.923 | -1.915.923 | 0 |
| **Cordage Fibers. Abaca-LB** | 0 | 155.000.000 | -155.000.000 | -80.600 | -80.600 | 0 |
| **Cordage Fibers. Sisal-LB** | 0 | 60.000.000 | -60.000.000 | -24.000 | -24.000 | 0 |
| **Diamond Dies. Small-PC** | 25.473 | 60.000 | -34.527 | -1.553 | -1.553 | 0 |
| **Diamond. Industrial. CR BRT -KT** | 23.692.782 | 22.000.000 | 1.692.782 | 4.317 | 0 | 4.317 |
| **Diamond. Ind Stones KT** | 18.723.796 | 7.700.000 | 11.023.796 | 245.550 | 0 | 245.550 |
| **Feathers and Down-LBS** | 0 | 1.500.000 | -1.500.000 | -21.825 | -21.825 | 0 |
| **Fluorspar. Acid Grade-SDT** | 895.350 | 1.400.000 | -504.650 | -70.651 | -70.651 | 0 |
| **Fluorspar. Metallurgical Grade-SDT** | 294.875 | 1.700.000 | -1.405.125 | -136.998 | -136.998 | 0 |
| **Graphite. Natural-Ceylon. Amo Lump-ST** | 5.442 | 6.300 | -858 | -813 | -813 | 0 |
| **Graphite. Natural-Malagasy Crystalline-ST** | 17.906 | 20.000 | -2.094 | -1.392 | -1.392 | 0 |
| **Graphite. Natural-Others-ST** | 1.933 | 2.800 | -867 | -158 | -158 | 0 |
| **Iodine-LB** | 8.009.811 | 5.800.000 | 2.209.811 | 15.756 | 0 | 15.756 |
| **Jewel Bearings PC** | 54.133.806 | 120.000.000 | -65.866.194 | -63.890 | -63.890 | 0 |
| **Lead-ST** | 601.026 | 1.100.000 | -498.974 | -359.262 | -359.262 | 0 |
| **Manganese. Battery Grade. Natural-SDT** | 190.864 | 62.000 | 128.864 | 10.567 | 0 | 10.567 |
| **Manganese. Battery Grade Syn-SDT** | 3.011 | 25.000 | -21.989 | -21.989 | -21.989 | 0 |
| **Manganese Ore. Chemical GR-SDT** | 220.955 | 170.000 | 50.955 | 4.178 | 0 | 4.178 |

# APPENDIX B

National Defense Stockpile Policy Division
Federal Emergency Management Agency

Comparison of Inventory to FEMA Goals

| | Inventory March 81 (Units) | FEMA Goals (Units) | Excess or Deficit (Units) | Excess or Deficit ($1.000) | Value of Deficit ($1.000) | Value of Excess ($1.000) |
|---|---|---|---|---|---|---|
| Manganese Ore. Metallurgical GR-SDT | 2.409.377. | 2.700.000. | −290.623. | −21.236. | −21.236. | 0. |
| Manganese. Ferro. High Carbon-ST | 599.978. | 439.000. | 160.978. | 73.303. | 0. | 73.303. |
| Manganese. Ferro. Low Carbon-ST | 0. | 0. | 0. | 0. | 0. | 0. |
| Manganese. Ferro. Medium Carbon-ST | 28.920. | 0. | 28.920. | 21.950. | 0. | 21.950. |
| Manganese. Ferro. Silicon-ST | 23.574. | 0. | 23.574. | 11.551. | 0. | 11.551. |
| Manganese Metal. Electrolytic-ST | 14.172. | 0. | 14.172. | 19.841. | 0. | 19.841. |
| Mercury-FL | 191.391. | 10.500. | 180.891. | 75.070. | 0. | 75.070. |
| Mica. Muscovite BL. ST & BET-LB | 5.005.704. | 6.200.000. | −1.194.296. | −6.460. | −6.460. | 0. |
| Mica. Muscovite FLM. 1st & 2nd-LB | 1.273.855. | 90.000. | 1.183.855. | 13.881. | 0. | 13.881. |
| Mica. Muscovite Splt-LB | 19.035.162. | 12.630.000. | 6.405.162. | 12.810. | 0. | 12.810. |
| Mica. Phlogopite Blk-LB | 16.718. | 210.000. | −193.282. | −416. | −416. | 0. |
| Mica. Phlogopite Splt-LB | 1.918.265. | 930.000. | 988.265. | 988. | 0. | 988. |
| Molybdenum Disulphide-LB Mo | 0. | 0. | 0. | 0. | 0. | 0. |
| Molybdenum. Ferro-LB Mo | 0. | 0. | 0. | 0. | 0. | 0. |
| Nickel-ST Ni + Co | 0. | 200.000. | −200.000. | −1.400.000. | −1.400.000. | 0. |
| Opium. Gum-AMA-LB | 31.795. | 0. | 31.795. | 6.715. | 0. | 6.715. |
| Opium. Salt-AMA LB | 39.508. | 130.000. | −90.492. | −52.388. | −52.388. | 0. |
| Platinum Group Metals. Ir-TR OZ | 16.991. | 98.000. | −81.009. | −48.607. | −48.607. | 0. |
| Platinum Group Metals. Pall-TR OZ | 1.252.788. | 3.000.000. | −1.747.212. | −244.609. | −244.609. | 0. |
| Platinum Group Metals. Plat-TR-OZ | 439.597. | 1.310.000. | −870.403. | −413.440. | −413.440. | 0. |
| Pyrethrum-LB | 0. | 500.000. | −500.000. | −6.125. | −6.125. | 0. |
| Quartz Crystals-LB | 2.420.838. | 600.000. | 1.820.838. | 10.925. | 0. | 10.925. |
| Quinidine-AV OZ | 1.798.762. | 10.100.000. | −8.301.238. | −35.697. | −35.697. | 0. |
| Quinine-AV OZ | 2.770.214. | 4.500.000. | −1.729.786. | −5.536. | −5.536. | 0. |
| Rubber-LT | 119.208. | 850.000. | −730.792. | −1.055.850. | −1.055.850. | 0. |
| Rutile-SDT | 39.130. | 106.000. | −66.870. | −21.732. | −21.732. | 0. |
| Sapphire and Ruby-KT | 16.305.502. | 0. | 16.305.502. | 179. | 0. | 179. |
| Silicon Carbide. Crude-ST | 80.548. | 29.000. | 51.548. | 23.197. | 0. | 23.197. |
| Silver (Fine)-TR OZ | 139.500.000. | 0. | 139.500.000. | 1.848.375. | 0. | 1.848.375. |
| Talc. Steatite BLK & LMP-ST | 1.092. | 28. | 1.064. | 394. | 0. | 394. |
| Tantalum. Carbide Powder-LB Ta | 28.688. | 0. | 28.688. | 4.970. | 0. | 4.970. |
| Tantalum Metal-LB Ta | 201.033. | 0. | 201.033. | 28.145. | 0. | 28.145. |
| Tantalum Minerals-LB Ta | 1.399.143. | 8.400.000. | −7.000.857. | −812.101. | −812.101. | 0. |
| Thorium Nitrate-LB | 7.141.812. | 600.000. | 6.541.812. | 17.990. | 0. | 17.990. |
| Tin-LT | 200.112. | 42.000. | 158.112. | 2.291.839. | 0. | 2.291.839. |
| Titanium Sponge-ST | 21.465. | 195.000. | −173.535. | −2.505.849. | −2.505.849. | 0. |
| Tungsten Carbide Powder-LB W | 1.921.167. | 2.000.000. | −78.833. | −1.171. | −1.171. | 0. |
| Tungsten. Ferro-LB W | 840.752. | 0. | 840.752. | 10.005. | 0. | 10.005. |
| Tungsten. Metal Powder-LB W | 1.566.964. | 1.600.000. | −33.036. | −459. | −459. | 0. |
| Tungsten Ores & Concentrates-LB W | 57.113.166. | 55.450.000. | 1.663.166. | 14.769. | 0. | 14.769. |
| Vanadium. Ferro-ST V | 0. | 1.000. | −1.000. | −14.100. | −14.100. | 0. |
| Vanadium Pentoxide-ST V | 541. | 7.700. | −7.159. | −77.955. | −77.955. | 0. |
| Vegetable Tannin. Ches-LT | 16.717. | 5.000. | 11.717. | 6.326. | 0. | 6.326. |
| Vegetable Tannin. Queb-LT | 142.691. | 28.000. | 114.691. | 67.644. | 0. | 67.644. |
| Vegetable Tannin. Wattle-LT | 16.397. | 15.000 | 1.397. | 782. | 0. | 782. |
| Zinc-ST | 375.970. | 1.425.000. | −1.049.030. | −894.297. | −894.297. | 0. |
| TOTAL | | | | −8.470.568. | −13.928.488. | 5.457.921. |

## ADMINISTRATION STOCKPILE PROPOSALS

Dr. MORGAN. The Administration will seek Congressional approval to sell the excess quantities of materials currently in the stockpile. We are seeking Congressional appropriations to acquire necessary stockpile material.

Mr. YATES. Does he say how much that appropriation is?

Dr. MORGAN. $120 million.

Mr. YATES. He says that there?

Dr. MORGAN. No, sir. He says we will use exchanges and barter to acquire additional stockpile materials when in the best interests of the country.

So this problem is recognized at the highest levels of the Administration, and the President himself is committed to taking remedial action.

Mr. YATES. I see by his statement, he is organizing a panel of experts to review the quality of the materials in the stockpile, and to protect the quality of the material which I think is good. Who does look at the quality of the materials?

Do we do that periodically?

Dr. MORGAN. Yes, sir. The stockpile is stored at over 100 locations throughout the country, and the General Services Administration has skilled inspectors who go around, sample it, and some of the materials that might deteriorate are rotated periodically. For example, natural rubber is sold off and new bought to replace it, and so on.

Mr. YATES. Well, do we have a window of vulnerability here?

## COBALT STOCKPILE STATUS

Mr. MORGAN. We would be happier if this stockpile were 100 percent on hand. However, there are alternatives for a number of items.

Take for example, cobalt which is 48 percent on hand in the stockpile. The President recognized how important cobalt is, and last year when the Congress appropriated $100 million for stockpiling, $78 million immediately went to cobalt.

So this figure, which is 48 percent now, within a few months as those deliveries are completed, will edge up beyond 51 or 52 percent. They bought 5.2 million pounds of cobalt.

If something terrible happened in Central Africa, we do know that out in Idaho there is the Blackbird Mine owned by Noranda, that could produce six to eight million pounds per year. We do know that at Fredericktown, Missouri, there is the Madison Mine owned by Anschutz Company, which could produce one or two million pounds per year.

Mr. YATES. At what difference in cost and quality?

Dr. MORGAN. I suspect they would have to have about $25 a pound, compared to the present price of about $10 a pound for cobalt from Zaire.

These two mines were producers in the Korean War period. So this is not some theory.

That is why we want to extend the Defense Production Act, and if we really had to move, we would finance those mines under Title III of the Defense Production Act, and in a 2- or 3-year period, they would be producing while we would have to draw down some of the stockpiled cobalt, but then their production would come on line.

### TANTALUM STOCKPILE STATUS

Similarly, with respect to tantalum; that looks bad with a stockpile inventory only 33 percent of the goal, and tantalum is highly important for jet engines and electronic applications.

But over in Australia, there is a new tantalum mine that could produce 850,000 pounds per year, but they are only going to produce about 250,000 pounds per year now. We know where they are, we have been in touch with them, and if we really needed that, they would step up their production.

So for every one of these materials, the Bureau of Mines knows where there are domestic or foreign possibilities of expansion which would be uneconomic under present depressed prices.

Mr. YATES. How much would your Australian mine have to sell tantalum for in order to be economic, and compared with the present price.

Dr. MORGAN. Tantalum has had wide price swings in recent years. A couple years ago, it was $180 a pound. It dropped now to about $50 or $60 a pound. If they had an assurance that the U.S. Government would buy it at, say, some number like $50 a pound, I think they would develop the mine to the larger capacity.

Mr. YATES. What is it selling for today?

Mr. MORGAN. Around $50, but you see, they don't have the assurance. If they came on with an additional quantity, the price could drop lower.

Mr. YATES. How many pounds would the Federal Government have to buy in order to raise tantalum to the 100 percent level?

Dr. MORGAN. The stockpile goal is 7.16 million pounds and the inventory is 2.391 million pounds, so we would have to go up 4.8 million pounds.

### DEPARTMENT OF DEFENSE REQUIREMENTS

Mr. YATES. Which of the metals on the chart are needed by the Department of Defense as critical materials?

Dr. MORGAN. I think the Defense Department will be particularly concerned and is concerned now with tantalum, columbium, cobalt, nickel, platinum, titanium, and to a lesser degree, chromium, because chromium is a more abundant material in that our stockpile is near the 100 percent status.

These high-temperature materials are needed not only for defense uses, direct Defense Department uses like the hot side of the jet engine, but also the same materials are used in heavy industry. Cobalt is the binder for the tungsten carbide in cutting tools, for example, and some cutting tools are coated with tantalum which gives extra performance.

Nickel and chromium are essential for stainless steels, of course.

Here is a mining bit from a continuous miner (holding up a specimen). The high-temperature alloy there at the end is what is doing the job.

Mr. YATES. We had testimony the other day from the Department of Energy on the turbine engine to the effect that one of the few things that the Department of Defense is doing is continuing some research on ceramic parts for turbine engines because they can't find the metals for it.

Now, I don't understand that because I am sure that the metals being used in the jet engines could be used for automobile engines.

I think probably the reason they can't be used is because of difference in cost.

Is my assessment correct?

Dr. **Morgan**. That's correct, sir. Probably the best jet engine that we have is the F-100 that goes into the F-15 and F-16 airplane.

That engine uses 14,000 pounds of many of these materials I just mentioned. They are pretty much the bill of materials for that engine in one form or another.

Mr. **Yates**. Size is a problem for Defense as well, right?

Dr. **Morgan**. That is right. They could make it out of metals but they are trying to save money by making it out of ceramic materials.

You could risk the failure of a ceramic material in a truck on the ground, which you cannot risk in an airplane up in the air.

Mr. **Yates**. Yes.

Dr. **Morgan**. If the ceramic fractures and flies apart, the truck stops and it doesn't make a lot of difference. But that engine up in the air has to keep going, no matter what.

Mr. **Yates**. Okay.

Dr. **Morgan**. Lastly, sir, we are asked, "What about the resource war?"

### STOCKPILE PURCHASING PROGRAM

Mr. **Yates**. Before we leave that, let me ask you this question. Do you work with FEMA at all on this purchasing program?

Dr. **Morgan**. Oh, yes sir. Day-to-day, the Bureau of Mines works with them on how much ought to be bought and the quality of the material. We help them in the inspection if there is a question of whether it can be used.

I can assure you we are working on a day-to-day basis with FEMA.

Mr. **Yates**. You don't buy any materials?

Dr. **Morgan**. The Bureau of Mines has only one material under its own control and that is helium, under the Helium Act of 1960.

We have a 40-year supply of helium down in the ground. That is the only one we are actively involved in maintaining.

Mr. **Yates**. Okay.

### INTERNATIONAL RESOURCE WAR

Dr. **Morgan**. We are asked occasionally about the resource war and if you look at figure 7 the offical coat of arms of the Soviet Union, which they designed for themselves a number of years ago, you notice that the hammer and sickle is placed not on the 8.5 million square miles of the Soviet Union, but is centered pretty much on western Europe, reaching well over Africa and towards North America and South America, so I don't think there is much question about their intentions.

Mr. **Yates**. At least that activity's intentions.

Dr. MORGAN. Right.

So the question is, then, what about their capabilities, because we don't want to deal with just intentions. But as Secretary Weinberger pointed out in his report to the Congress on "Soviet Military Power," the Government believes that the U.S.S.R. is gradually encroaching on the supply of materials to deny them to the free world and when we look at the Soviet mineral dependence chart, figure 8, in comparison to the U.S. chart, figure 3 there is roughly the same list of commodities for comparison. You will note they are dependent on imports for only a few commodities, whereas the U.S. is dependent on imports for many more.

And in cases where they do import, it is usually from countries over which they have rather considerable control.

Mr. YATES. That is not true in the case of tungsten, though.

Dr. MORGAN. China and Mongolia, right, they have less control there.

Mr. YATES. And also Fluorine.

Dr. MORGAN. Mongolia, China and Thailand, yes.

Mr. YATES. I had the impression that the Soviet Union was rich in cobalt. Your chart indicates they import it from Cuba.

Dr. MORGAN. There is an interesting story there that in World War II, the United States Government built the Nicaro Nickel Works in Cuba and in the Korean War period, we upped the productive capacity from 30 million pounds of nickel to 50 million pounds per year of nickel and we financed the Moa Bay Nickel Refinery for another 50 million pounds, that is 100 million pounds of nickel capacity.

They also get about 4 million pounds a year of cobalt which is associated with the nickel. So these are operations which were built and financed by the U.S. Government, expropriated by the Cuban Government, and now the nickel and cobalt going to the Soviet Bloc.

Mr. YATES. Has anybody ever discussed the possibility of buying cobalt from Cuba? The reason I ask is because we buy cobalt from the Soviet Union, don't we?

Dr. MORGAN. Not cobalt from the Soviet Union, but we do buy platinum and other commodities.

Mr. YATES. From the Soviets.

Dr. MORGAN. From the Soviet Union, yes.

Mr. YATES. We don't buy anything from Cuba now, do we, not even cigars?

Dr. MORGAN. I believe it is embargoed, yes.

Mr. YATES. Okay, Dr. Morgan, and thank you very much for an excellent summary.

Dr. MORGAN. Thank you, sir.

Mr. YATES. Thank you.

Dr. MORGAN. If I might, in conclusion, remind you to extend the Defense Production Act.

Mr. YATES. Okay. I hear you well.

### PURCHASING OF MATERIALS FOR STOCKPILE

I don't know whether we aren't spending money to buy some of those materials. If you had your choice, which of the materials would you be buying now?

Dr. **MORGAN**. I would buy high-temperature corrosion-resistant, abrasion-resistant materials needed for jet engines.

Mr. **YATES**. Specify which ones, cobalt?

Dr. **MORGAN**. Cobalt, columbium, tantalum, platinum, titanium.

Mr. **YATES**. We don't really have a program to buy those, do we? We have the President's statement that we will, but there is no program for buying them over any specified period of time.

Dr. **MORGAN**. Well, yes, sir, there is. FEMA has the program.

Mr. **YATES**. What is the period of time?

Dr. **MORGAN**. They supply to the Congress a 5-year buying program laid out in advance, but the Congress has to appropriate the money to do it and they have to authorize the sale of excess material.

Mr. **YATES**. Has FEMA provided Congress the program for the last number of years?

Dr. **MORGAN**. Yes, sir, it is confidential and provided to the Armed Services Committee.

Mr. **YATES**. What is confidential about it?

Dr. **MORGAN**. They don't want——

Mr. **YATES**. Because of trading commodities?

Dr. **MORGAN**. They don't want to get the markets all upset, market impact. So the plan is there. There is a clear plan.

In interagency committees, sir, over the years, they have identified four items which all the agencies think should be of first priority.

Those were cobalt, guayule rubber—a natural rubber, refractory grade bauxite, and titanium.

But those were under the Defense Production Act and the emphasis there was to try to get expansion of productive capacity. But your question to me was, what should we buy for the stockpile, and that was a little different list of materials.

Mr. **YATES**. Yes, it was, indeed.

### DOMESTIC MINERALS DEVELOPMENT VS. PURCHASING

Does your four-commodity production program obviate the need for the purchasing?

Dr. **MORGAN**. Wherever we can develop domestic capacity, every one ton of domestic capacity reduces the need for the stockpile by three tons and, therefore, if it can be done at reasonably close prices to the foreign price, it would be more economical to develop domestic capacity under the Defense Production Act than to buy material under the Stock Piling Act.

Mr. **YATES**. How are you going to develop guayule rubber in this country?

Dr. **MORGAN**. That is——

Mr. **YATES**. Is that a synthetic rubber?

Dr. **MORGAN**. No, sir, it is a natural plant and has been used for natural rubber in the past.

Mr. **YATES**. Where could it be grown?

Dr. MORGAN. It is grown now in Mexico and could be grown in California and Arizona and some wild guayule is growing there now. There is a research program under a Guayule Rubber Act passed by Congress a few years ago.

The Defense Department right now is looking at the implementation of a multi-million dollar domestic guayule program.

Mr. YATES. I guess under this budget, if it is done at all, it will have to be done in the Defense Department.

Dr. MORGAN. The Defense Department at the present time has $30 million under Title III of the Defense Production Act for loan guarantees.

Mr. YATES. For development.

Dr. MORGAN. They are looking at that at the present time.

Mr. YATES. Dr. Morgan, I think you may have left the record in doubt as a result of my questioning. Should we be buying the materials in addition to developing the four you specified?

Dr. MORGAN. Sir, I specially think we should, but I think we have to recognize that the President has an overall responsibility for weighing all of the demands upon the economy. And in his wisdom he has come up with a number in the budget and we fully support the number in his budget.

Mr. YATES. Of course you do.

### NATIONAL MATERIALS AND MINERALS PROGRAM PLAN

You discussed the President's plan. What specific parts of the plan relate to the Bureau of Mines programs?

Dr. MORGAN. I think Mr. Horton, sir, is in the best position to tell about that since he is our leader and we are very glad to have him, as a permanent leader, with us.

Mr. YATES. All right. We will listen to the peerless leader.

You indicated that you have an interagency committee that works on it, and you are a part of that. You also indicated that you work with GSA in their purchasing and testing the quality and pricing of the product.

Dr. MORGAN. Yes, sir.

Mr. YATES. All right. Those are two items which you indicate as parts of the President's plan. What are the others?

Mr. HORTON. As part of the plan?

Mr. YATES. Yes.

### CONTINUING INVENTORY OF FEDERAL LANDS

Mr. HORTON. This Administration will continue to inventory Federal lands to determine the mineral availability and potential of that land. Both the United States Geological Survey and the Bureau of Mines currently do land assessments in Forest Service areas, wilderness areas, areas proposed for wilderness withdrawal, Indian lands. It is proposed——

Mr. YATES. Aren't you marching backward on that; your budget has been cut by almost $4 million for that program, if my interpretation of your budget is correct?

Under the item of land assessments, in 1982 you received $9.412 million for the purpose you have just stated; for 1983 you are requesting $5.427 million, which is a $3.985 million reduction. Isn't that backward marching?

Mr. HORTON. No.

Mr. YATES. It is not?

Mr. HORTON. The reduction is because of the completion of a large portion of the work on the Forest Service lands.

Mr. YATES. So that leaves less work for you to do; is that what you are saying?

Mr. HORTON. Yes, sir. We propose that this program continue. Though there may not necessarily be any proposed wilderness areas, we would continue the assessments of Federal lands.

Mr. YATES. I see. Is $5.4 million adequate for that purpose?

Mr. HORTON. Yes.

### REVIEW OF WITHDRAWN LANDS

Mr. YATES. One of the other positive statements in your justification is: "This Administration will accelerate the review of lands withdrawn for mineral exploration and revoke obsolete withdrawal orders, continue the rapid withdrawal review program for Alaska lands."

What does that mean? Withdrawal of what?

Mr. HORTON. It means to revoke obsolete withdrawal orders where the land was withdrawn from mineral entry. There are many minor statutes that have withdrawn substantial chunks of land, as well as other administrative orders. They all need to be reviewed to see if that land should remain withdrawn.

I am not referring to national wilderness areas or national parks, but to large areas of lands that are otherwise covered.

Perhaps apropos of Dr. Morgan's recent comments, the policy also states that executive agencies, including the Bureau of Mines, will, when appropriate, prepare and present to the Congress strategic and critical mineral impact analysis.

### FOREST SERVICE LAND ACREAGE

Mr. YATES. Okay. Let me go back to the previous question. You indicated you completed your work on the Forest Service lands, and therefore, more money was not needed.

What is the total acreage of the lands that you have to survey for this purpose?

Mr. HORTON. That we surveyed?

Mr. YATES. The acreage that you have to survey for this purpose, yes. You have been working with Interior you say.

Mr. HORTON. Yes.

Mr. YATES. What is the total number of acres that you have to survey?

Mr. HORTON. There are 37.9 million acres in two categories. 25.1 million are in wilderness lands and 12.8 million in RARE II lands.

Mr. YATES. In RARE II lands?

Mr. HORTON. Yes.

Mr. YATES. You do not do any work outside of these two categories in survey?

Mr. HORTON. Not in this particular review. We do do quite a bit of work on Indian reservations that are funded by the Indian tribes and BIA.

Mr. YATES. But the wilderness lands are withdrawn from your review now, you say you are not going to do it in the wilderness lands?

Mr. HORTON. We are winding up the Forest Service——

Mr. YATES—aspect of the wilderness?

Mr. HORTON. Yes.

Mr. YATES. I see. How many acres remain?

Mr. HORTON. For us to do?

Mr. YATES. Yes.

Mr. HORTON. We completed 21.3 million acres on wilderness and 1.7 on the RARE II through 1981. Much of the work left to do on some of these centers on the preparation of reports rather than on field work. Field work is much more expensive.

Mr. YATES. Your justification refers to a lower per-acre cost; what does that mean?

Mr. HORTON. The report-writing portion.

Mr. YATES. Is this the only place in your budgets, where the President's plan is being implemented?

Mr. HORTON. Pardon?

Mr. YATES. Is this activity the only one in your total budget where the President's plan is being implemented?

Mr. HORTON. In our budget?

Mr. YATES. In your budget?

Mr. HORTON. No.

## MINERALS DATA COLLECTION AND ANALYSIS

Mr. YATES. How else in your budget do you propose to carry out the President's plan?

Mr. HORTON. Well, continuing with the positive statements.

Mr. YATES. Sure.

Mr. HORTON. Another one is that this Administration will continue to collect minerals data and use them in monitoring trends and events affecting supply and demand. We will also consult with other nations to improve the exchange of minerals information and do the same between Federal Agencies and States.

We are putting substantial emphasis on the improvement of our data collection and data analysis activities. This will involve no additional funding, but more in-depth studies. We are working hard to improve our collection of foreign information.

As a matter of fact just, yesterday and the day before we met with several representatives from South American countries. We had arranged through the OAS for a symposium here in Washington, D.C. on mineral data collection and invited the South American countries to participate, which they did. We are quite enthused with their continuing interest in the collection of data.

Mr. YATES. How frequent are your meetings, for this information, with foreign Governments?

Mr. HORTON. This was a first, through the Organization of American States. We have agreements with several foreign countries on data collection and on research.

Within our Information Division we have experts on every country in the world. They have local contacts. I can't say that they all meet on a regular basis, but they do on a convenient basis with either people from the State Department or representatives of the particular foreign country.

Mr. YATES. When will your next meeting take place?

Mr. HORTON. We do not have another formal meeting scheduled. It is a continuing operation.

Mr. YATES. I do not understand what you mean, a continuing operation. Are you in touch daily with foreign governments?

Mr. HORTON. No, sir. But we are on a more or less regular basis jointly collecting and analyzing data. We have contact either through the State Department or directly at meetings, sometimes within the foreign country. At these meetings we interact with our counterparts, with the equivalent of their Bureau of Mines.

I have had meetings recently, along with some of the others in the data collection staff, with the Canadians, South Africans and South Americans.

### U.S. VERSUS FOREIGN RESEARCH AND DEVELOPMENT

Mr. YATES. How would you compare the foreign government research and material development with that of our country?

Mr. HORTON. It runs the spectrum. The materials research in many of the European countries, and Canada is certainly on a par with ours. Other countries about which I have some personal knowledge, as in South America, do an excellent job considering the limits on their budgets.

Mr. YATES. Which countries are you talking about?

Mr. HORTON. In South America?

Mr. YATES. Yes.

Mr. HORTON. Brazil, Chile, Peru, Argentina.

Mr. YATES. Are their budgets more limited than ours?

Mr. HORTON. Yes, quite a bit less. They have quite small staffs.

Mr. YATES. Are there any plans for them to expand the size of their staffs and of their research and development?

Mr. HORTON. I do not know of any.

Mr. YATES. If they were going to do it, they would have told you, wouldn't they?

Mr. HORTON. I presume so.

Mr. YATES. Yes. Presumably that is the purpose of the meetings, to compare what you are doing and how to help each other.

Mr. HORTON. Yes, it is.

### MINERALS TRAINING PROGRAM

Mr. YATES. When are you planning to establish the minerals training program for the State Department personnel who are going to work with the Regional Resources Officer program?

Mr. HORTON. We have initiated correspondence with the State Department through the Assistant Secretary and are actively seeking to establish times and agenda at the present time.

Mr. YATES. How much will it cost to implement it?

Mr. HORTON. Until we know exactly what we will have to do, I am uncertain.

At the present time, the Bureau of Mines does not allocate any money to the State Department for its particular staffs. Other agencies within the Government have representatives at councils and embassies. The commercial attaches at U.S. Embassies handle that work as collateral duties.

Mr. YATES. Will there be any cost in your budget for that?

Mr. HORTON. It will be borne within the mineral data information portion.

Mr. YATES. Okay.

### STRATEGIC AND CRITICAL MINERALS RESEARCH

Mr. HORTON. The President also cites R&D on strategic and critical minerals. We will be concentrating on that in our research and development efforts.

Mr. YATES. How much money have you allocated in your budgets for that purpose?

Mr. HORTON. We have asked for an increase of $1.6 million. By rebudgeting and reprogramming from last year plus the $1.6 million, we will have an additional $10.1 million over the next 2 years for strategic and critical minerals.

Mr. YATES. How much money was in your budget for 1981 for this purpose?

Mr. HORTON. Mineral resource technology was $24.4 million.

Mr. YATES. This is the budget that is used for work on the strategic and critical materials?

Mr. HORTON. Yes. About 70 percent of that is now on strategic.

Mr. YATES. How much is that figure?

Mr. HORTON. $24.4 million for the mineral resources technology program.

Mr. YATES. How much was in the budget for 1982?

Mr. HORTON. $31.3 million.

Mr. YATES. All right. How much is in the budget for 1983?

Mr. HORTON. $33.9 million.

Mr. YATES. The budget people consider this to be an important activity, don't they?

Mr. HORTON. Yes, sir.

Mr. YATES. And how much did you ask the Department for?

Mr. HORTON. $35.4 million.

Mr. YATES. Right. The Department sent you to OMB with an allowance of $33,888,000?

Mr. HORTON. Yes.

Mr. YATES. OMB approved that same amount, right?

Mr. OYLER. Yes, sir.

Mr. YATES. How badly were you hurt by the loss of $1.5 million?

Mr. HORTON. We were not badly hurt and only had to make some minor adjustment.

Mr. YATES. Such as what?

Mr. HORTON. Reducing some of the research we had been doing in the nonstrategic and noncritical area.

Mr. YATES. What is the greatest amount that had ever been allocated for this purpose in your budget; would you know? Had you had more money for the purpose than that in prior budgets?

Mr. OYLER. That was about the high point, Mr. Chairman, since about 1976.

Mr. HORTON. There probably were some larger budgets back in the Korean War period, sir.

Mr. YATES. What other agencies are involved in collection of minerals data?

Mr. HORTON. We are the principal ones in mineral data. Commerce does some on manufactured goods. The Department of Energy is responsible for fuels. Our data are all nonfuels.

Mr. YATES. Is there any problem respecting providing adequate protection for proprietary or classified data?

Mr. HORTON. No, sir.

### MINERALS HEALTH AND SAFETY TECHNOLOGY

Mr. YATES. Let's talk about minerals health and safety technology.

You have been cut by $9.467 million, if the figures on BM-14 of your justification are correct. The 1982 appropriation is $46 million; that was increased to $47.290 million, and then it is being cut by $9.467 million.

We have had several major mine disasters in recent months. Why should this be cut so drastically?

Mr. HORTON. I do not think you can make a direct correlation between the several major mine disasters and the cut in this particular budget.

Mr. YATES. Tell me why.

Mr. HORTON. Our research would not have done much for these two mine disasters.

Mr. YATES. Would you explain that further?

Mr. HORTON. Yes. I do not wish to appear unsympathetic. I have been involved in a number of mine disasters. These latest disasters were occasioned by poor practice in the handling of explosives, shooting in the solid for one thing. The practice is prohibited in most States.

I believe there are two States where it is allowed. It is one of those States in which two of those accidents occurred.

Mr. YATES. Should the Federal Government bar it, do you think?

Mr. HORTON. I think it is more appropriate that the States do that.

Mr. YATES. I agree with that, but is the practice so bad, so dangerous, that if the States don't do it, the Federal Government should do it?

Mr. HORTON. Yes. But in this instance, I do not know for a fact that if the Federal Government barred it, the people would have been prevented from doing it. They were doing so at the risk of their lives. If the Federal Government were to bar it, they would be doing it at the risk of breaking a law.

Mr. YATES. You mean they would still be doing it even though the Federal Government would prohibit it?

Mr. HORTON. Yes, I do not know why they wouldn't. I would much sooner risk breaking a law than losing my life.

Mr. YATES. I do not understand——

Mr. HORTON. These were not large mines.

Mr. YATES. I know, they are small mines. Is this the only way they can extract the coal, by using a procedure of this kind?

Mr. HORTON. No.

Mr. YATES. Then why, if we pass a law prohibiting it, wouldn't they go to some other method?

Mr. HORTON. You would imagine they would go to another method just to protect their lives. In this particular instance, to avoid shooting in the solid, you could make a cut at the floor or a cut on the side and sometimes both to give additional free faces to which to blast. That way you do not have to use so much powder and do not risk a blowout.

This requires buying the equipment to make those cuts. They perhaps choose not to buy it, perhaps cannot afford it.

Mr. YATES. Is it expensive equipment?

Mr. HORTON. Yes, but it is cheaper than your life.

Mr. YATES. That is part of the reason for passing laws, to try to minimize the occurrence of dangerous practices. Why did the States pass these laws then if what you say is true? Apparently the States believe that by passing the laws they were adding a compulsion to the owners not to resort to those practices, and that the owners would have to look around for other means of extracting the coal rather than breaking the law.

Before the passage of those laws, those who engaged in the practice were willing to risk the lives of the workers, otherwise the laws would not have been passed. Now that the laws are passed, how many of those mines still break the law?

Mr. HORTON. The major mines would not.

Mr. YATES. Do the small mines still break the law in the States where there are laws prohibiting that practice? Do you know whether that is true?

Mr. HORTON. I do not know.

Mr. YATES. Yes. I think we ought to find that out. I am not sure that the Congress would pass such a law. Certainly most of the States think that such a law is appropriate, they passed them; that is correct, isn't it?

Mr. HORTON. Yes.

Mr. YATES. Okay.

Mr. HORTON. Yes. I should remind you that it is MSHA that administers the law rather than the Bureau of Mines. They would perhaps more properly address this aspect. Let me speak a little bit on that.

### SAFETY ATTITUDE TRAINING APPROACH

If I have spoken harshly, having been a small miner, I sometimes get upset with others for doing some dumb things. When I was a small miner I did some dumb things too. I have been in a cave-in by a stupid practice.

Mr. YATES. Let me interrupt.

Did you have to indulge in that stupid practice?

Mr. HORTON. No.

Mr. YATES. Why did you do it then?

Mr. HORTON. Trying to get some ore out in a hurry.

Mr. **Yates**. All right.

Mr. **Horton**. Which I think is the reason for the coal disasters.

Mr. **Yates**. Go ahead.

Mr. **Horton**. We have had some interesting studies on attitudes, both in miners and in management.

One of the best saviors, I think perhaps for the small miner, is to work with him regarding safety attitudes. Somehow or other he needs to have the same training or insight that hopefully is provided in some of the larger mines, so that he will become more respectful of the problems involved. That would be a proper activity for the Bureau.

Mr. **Yates**. Yes, I would think so.

But is there any doubt that the practice about which you have testified should be barred?

Mr. **Horton**. No.

Mr. **Yates**. There is no doubt about that at all?

Mr. **Horton**. No.

Mr. **Yates**. What are the small miners going to learn by going to the big mines? Are they not going to indulge in the same practices in the small mines?

Mr. **Horton**. I am sure that the individuals in this case certainly did not set out to commit suicide. MSHA has done the investigation. I am not privy other than in a general nature as to what was going on. But I would imagine that they had some coal sold, they had a contract to fill, they had to get some coal out, and did not have the time for some of the niceties of mining. The practice can be followed for hundreds and hundreds of times with no unfortunate results, but you are playing a little Russian roulette and finally hit a full cylinder.

### RELATIONSHIP BETWEEN RESEARCH AND MINE DISASTERS

Mr. **Yates**. I am off on a tangent here somewhat.

We were talking about the cut in your appropriation, and I asked: Should the committee accept that cut in view of the recent mine disasters? You indicated that at least in two of those instances whatever research you are doing would not have helped.

We started to talk about this technique of extracting the coal. Is there no relationship between this research program and the possibility of avoiding disasters of the kind that occurred?

Mr. **Horton**. Yes, there is.

Mr. **Yates**. There is such a relationship?

Mr. **Horton**. Yes.

Mr. **Yates**. Okay. If there is such a relationship, why should this program be cut?

Mr. **Horton**. I can't defend the cut in health and safety; it would be foolish for me to try on humane grounds.

Mr. **Yates**. I do not want to put you in trouble with OMB. OMB has you in a straitjacket just as it has everybody who comes before this committee, and I assume every other congressional committee, to testify on this budget.

They tell you not to tell us anything that would be helpful to us in increasing the appropriation. And yet we have to consider this health and safety question and we have to press you, because if, indeed, this reduction in the appropriation will result in abridging the possibility of avoiding deaths and injuries in the future. I think we would be foolish to accept the cut; I think we should put that money in. That is why I continue to press you.

You say you can't defend it. I do not know whether you ought to leave that in the record.

Mr. HORTON. No, I said on humane grounds.

Mr. YATES. Humane grounds. That is a pretty good ground.

Mr. HORTON. On the basis of the general assumption that the more money you spend for health and safety, the more lives you are going to save.

Mr. YATES. Is that the only connection? That is not necessarily true. You can waste money in programs too.

Mr. HORTON. Yes.

Mr. YATES. I assume your programs are better than that. I assume your programs are more specific, more realistic and more identified with tangible mining problems that would obviate or reduce the possibility of such accidents in the future. Do I have the wrong assumption?

Mr. HORTON. No, no.

Let me speak for a while to your question.

Mr. YATES. Sure. It is an important question.

Mr. HORTON. Indeed it is. The President has emphasized that the Government should do that research, but only that research which would not be more properly done by industry, concentrating on long-range, high-risk research.

Mr. YATES. Sure.

### APPROPRIATENESS OF HEALTH AND SAFETY BUDGET REQUEST

Mr. HORTON. I have thought long and hard about the health and safety budget. And I am not certain that even on what I might assume is humane grounds that the reduction is inappropriate at this time.

Mr. YATES. You mean because of budget constraints?

Mr. HORTON. Because of budget constraints and because of the need to do some deep thinking about health and safety. Sometimes one can get too busy spending money to start doing anything about some of the real problems.

There has not been a substantial decrease in the fatal injuries and injury rates for the last several years. It has almost been level, at least since 1975–76. There have been some small ups and small downs, but random deviations might account for that.

I mentioned earlier some of the recent work that we have had done in attitudes for comparison between mines.

Mr. YATES. Sir, then why appropriate even the amount that you request? Why don't you just delete the entire program and think about it for a year?

Mr. HORTON. We need some money to think about the problems.

Mr. YATES. How much money do you need to think about it, $2 million instead of $38 million?

Mr. HORTON. No, $37.8 million.

Mr. YATES. You need that to engage in actual research programs, don't you?

Mr. HORTON. Yes.

Mr. YATES. Why $37 million instead of $47 million? Are you going to do thinking for $10 million? You see the budget for this year is $47 million?

Mr. HORTON. Yes.

Mr. YATES. You request a $10 million cut, so you are going to think $10 million worth.

Mr. HORTON. No, I do not mean to imply that.

Mr. YATES. Okay.

Let me put my question another way. Here but for the grace of God sit you in this chair. We have to decide how much money should go into this budget, in the whole budget, but we are particularly concerned with trying to find ways of making the lives of the miners going into the bowels of the earth safer. You are interested in that, too.

Mr. HORTON. Certainly.

Mr. YATES. Sure you are. We too are under a budget constraint, but perhaps not to the same extent you are. We have to think of what the public health and safety of the country requires. If another $2, $3, $4 million will help avoid one of these accidents in the future, perhaps we ought to do it.

I am a little bit disturbed by your saying that even with the amount of money that we have put into the budget, and it has been substantial over the years, very substantial, that nevertheless the level of mining accidents remains the same.

What you are saying is that there is no relationship between this program and the accidents that take place. I am sure you do not want me to draw that conclusion.

Mr. HORTON. No.

Mr. YATES. Okay. What conclusion do you want me to draw?

Mr. HORTON. I think you have jumped to some broad general assumptions on what I hope will be less broad statements.

Mr. YATES. You said that in the last several years that the accident rates have been almost level. I thought I understood you to say that.

Mr. HORTON. I did say that.

Mr. YATES. Okay.

### MINE FATALITY STATISTICS

Mr. HORTON. But the work that the Bureau of Mines has done over these last many decades has been very effective in reducing fatalities. It has been effective in reducing fatalities in the last 10 years.

The fatal injury rate from 1971 was .17 per million man-hours; it is now half of that, .08.

Mr. YATES. Then your previous statement was wrong?

Mr. HORTON. No, sir.

Mr. YATES. Okay.

Mr. HORTON. Because in 1975 it was .09; in 1976 it was .09; in 1977 it was .08; in 1978 it was .07; in 1979 it was .09; and in 1980 it was .08. For the last 5, 6 years it has been nearly level.

A lot of the fatal injuries are related to catastrophes. A catastrophe occurs in a random fashion too. So one must be careful about the time frame used in order to draw conclusions.

Mr. YATES. Okay.

Mr. HORTON. We have had some recent studies——

Mr. YATES. Mr. Oyler, I think you are disturbing Mr. Horton's thinking on this. You ought to let him finish his answer and then supplement it or else give him a written statement. He is trying to listen to you and explain it to me at the same time and that is impossible.

Go ahead.

### COMPANY ACCIDENT HISTORIES

Mr. HORTON. We have had some recent studies comparing accidents, accident histories between mining companies.

Mr. YATES. Yes.

Mr. HORTON. The question is reasonably asked, why are some mining companies' operations consistently safer than others?

Mr. YATES. Right.

Mr. HORTON. There are not really obvious answers. In one particular study that I remember, the accident rate was 3 per thousand in one mine and 24 per thousand in another. Those are the two extremes in the sample, a frequency difference of 8. There is much work, I am certain, to be done in that field.

We are doing some now in a program that has nothing to do with equipment, techniques, or safer structures. It has to do with attitudes both on the part of management and on the part of miners.

We have identified particular instances where companies used almost identical equipment and techniques. There were accidents. So they were not a fault of the equipment, but of the people, both probably management and the worker. If we can look hard at that and come up with some answers, we may be able to make the same magnitude of change that occurred between 1971 and 1975.

Mr. YATES. Okay. I think you have a valid point.

I remember testimony from previous years in which the Director of the Bureau of Mines told us that even though the Bureau of Mines had recommended certain kinds of practices for miners, either wearing a kind of a lamp or a kind of protective device of some kind, the miners found them cumbersome in connection with the mining and they refused to wear them.

Mr. HORTON. Yes.

Mr. YATES. So they themselves might have been given an element of the responsibility for accidents that occurred to them?

Mr. HORTON. Yes.

Mr. YATES. So there is that aspect of it.

The answer is, try to find some other equipment devoted to their safety which is less cumbersome and I assume some of your research will be devoted to that kind of practice.

Mr. HORTON. Yes.

Mr. YATES. All right. We are back to the question again, we are going to cut $9 million out of this budget, here but for the grace of God sit you. Do you want to leave it out of the budget?

Mr. **Horton**. Leave what—I thought we were back to the zero base.

Mr. **Yates**. No, no. I do not want to embarrass you in any respect, but this committee has a job to do, to try to figure out how much money we should recommend for this. I am sure if Mr. McDade or Mr. Murtha were sitting here, they would be pounding away at you on this subject. They are not big central government people, but they are living with these miners day-in and day-out, in their constituencies.

I have miners in southern Illinois. We have them I assume in almost every State of the Union. How do you make their life an easier one as they go into this? A safer one, apart from questions of easiness, a safer one?

Well, I think we have explored it enough. If you want to expand on your answer you may do so.

[The information follows:]

### Bureau of Mines Role in Health and Safety Research

The Bureau has encouraged, in full accord with the President's National Minerals Policy, released April 5, 1982, and will increase its efforts to encourage industry to take a larger role in research. Industry is expected to assume more mine-specific compliance-related research and demonstration of bureau developed solutions to basic problems. This is industry's proper role and will substantially reduce the cost of carrying out research by the Bureau because of reduced labor, equipment, and demonstration costs. The reduction in research costs will contribute to the solving of our Nation's economic problems by reducing Federal spending.

The Health and Safety Research Program for fiscal year 1983 will address, through basic research, the critical health and safety problems of the mining and minerals industry. The program has progressed from developing compliance technology needed in the early 1970's for meeting the regulations to one of investigating basic causes of health and safety problems. The short-term compliance research did serve a useful purpose by ensuring that the mining and minerals industry could continue to operate under the new regulations and offered many "quick fix" solutions. These solutions did not always solve the basic health and safety problem, but lessened their impact. As the program matured, the need for more basic research concerning the causes of health and safety problems became evident. As a result, the program has moved toward long-term and high-risk research seeking optimal solutions with a long-term payoff.

### HISTORY OF BUDGET REQUEST FOR HEALTH AND SAFETY RESEARCH

You asked the Department for $47 million and the Department was very sympathetic, they gave you $3.5 million more than you asked for. Then OMB cut $13 million out.

Would you place in the record a list of what OMB cut out?

Mr. **Horton**. Yes.

Mr. **Yates**. I think that is the easiest way to terminate this discussion.

[The information follows:]

### History of Budget Request for Health and Safety Research

The President's Budget in fiscal year 1983 for Health and Safety Research includes $37,823,000, a reduction of $12,926,000 from the Department request to OMB as follows:

[In thousands of dollars]

| Program area | Fiscal year 1983 department request | Fiscal year 1983 President's budget | Fiscal year 1983 reduction |
|---|---|---|---|
| Health Engineering Technology: | | | |
| Respirable dust | 4,129 | 4,129 | 0 |
| Radiation hazards | 1,033 | 757 | 276 |
| Noise control | 2,563 | 1,655 | 908 |
| Industrial hygiene | 2,374 | 1,823 | 551 |
| Ventilation | 967 | 524 | 443 |
| Subtotal, health engineering technology | 11,066 | 8,888 | 2,178 |
| Safety hazard reduction: | | | |
| Fire and explosion | 4,055 | 3,162 | 893 |
| Methane control | 2,909 | 2,019 | 890 |
| Ground control | 12,531 | 10,087 | 2,444 |
| Industrial hazards | 12,880 | 8,474 | 4,406 |
| Post disaster | 2,058 | 1,413 | 645 |
| Explosives | 1,418 | 1,221 | 197 |
| Systems engineering | 3,832 | 2,559 | 1,273 |
| Subtotal, safety hazard reduction | 39,683 | 28,935 | 10,748 |
| Total, health and safety technology | 50,749 | 37,823 | 12,926 |

## INDUSTRY RESEARCH RESPONSIBILITY

Mr. YATES. You make the statement: "Industry will assume greater responsibility for funding demonstrations." I do not think that is true. Industry never did it before until the Government forced them to do it?

Mr. HORTON. What demonstrations?

Mr. YATES. For safety. You say:

"As a result of the 1981 tax legislation and with the continuing efforts of the Bureau of Mines to encourage industry participation in cooperative research, it is expected that industry will assume greater responsibility for funding demonstrations of Bureau-developed technology and for short-term research where an immediate benefit in improved health or safety can be achieved."

Let's wait and see whether they do. Your big mines may do it, your smaller mines are not going to, are they?

Mr. HORTON. No. The larger mines and equipment manufacturers have been quite helpful.

Mr. YATES. Has the Bureau done anything to facilitate placing greater responsibility on industry other than cutting back your appropriation in providing for greater health and safety? That is in line with my last question.

Mr. HORTON. We really cannot put the responsibility on industry. MSHA does that. We are putting perhaps more responsibility for research on industry, asking for additional cooperation and that it fund more of the activity, particularly in equipment.

Mr. YATES. Let's turn to another statement in the justification then.

In the middle of paragraph 2, page 15, you say this: "The industry at present does not have adequate organization, facilities, research, expertise and dedicated funding needed for such a program.

The Bureau has the only existing research facilities and personnel to conduct a systematic long-term program of research and development to improve mining technology for the protection of the health of miners."

But yet you insist on telling the committee that you are going to put a greater burden on industry to do it. You can't have it both ways. You cannot say that industry is not in a position to do it and then say we are going to let industry do it.

Mr. HORTON. Some of our——

Mr. YATES. Do I misread what you——

Mr. HORTON. No, sir; I misstated.

Mr. YATES. That is what I have here.

Mr. HORTON. Yes.

Mr. YATES. I think that answers the questions we had before, a great many of them.

### REDUCING BURDENSOME REGULATIONS

What burdensome regulations are you now trying to relieve industry of?

Mr. HORTON. Is this in the health and safety aspects?

Mr. YATES. Yes. You said MSHA does that. You talk about burdensome regulations. What burdensome regulations do you have in mind?

Mr. HORTON. We work closely with MSHA. We do its research work and establish and recommend the criteria for health and safety regulations. We are trying to have those regulations establish realistic requirements and demands, those which can be met.

Mr. YATES. Since you make reference to burdensome regulations, what burdensome regulations do you have in mind? I have heard that phrase time and again in all kinds of Government activity, and when I try to find out what they have in mind, it evaporates.

Mr. HORTON. One of the major ones has been the self-rescuer.

Mr. YATES. That MSHA has required?

Mr. HORTON. Yes. They are awkward to handle now.

Mr. YATES. How would you change it?

Mr. HORTON. By developing lighter and longer-lasting items that the miner would indeed wear.

Mr. YATES. That is what we were talking about a few minutes ago?

Mr. HORTON. Yes.

Mr. YATES. Okay.

### ELIMINATION OF SILICOSIS

What portion of the respirable dust program is devoted to elimination of silicosis as a threat to surface mine workers?

Mr. HORTON. That is a portion of dust control for both underground and surface.

Mr. YATES. I realize that, but you don't have it allocated by amounts.

Mr. HORTON. No, sir.

Mr. YATES. Can you tell us whether you expect the private sector to assume a part of the respirable dust activity?

Mr. HORTON. Yes, we do. Though we put substantial emphasis on that, we have had good success and cooperation of industry. We have done a lot of work on control of dust on longwall mining, which is a safe mining technique, but generates large quantities of dust. We have many companies working with us on that.

Mr. YATES. Are you eliminating part of the program on respirable dust?

Mr. HORTON. We are reducing that budget somewhat from the base, by $837,000, for respirable dust in coal research.

Mr. YATES. $837,000?

Mr. HORTON. Yes.

Mr. YATES. Isn't it an important program?

Mr. HORTON. Yes, sir.

Mr. YATES. Well then, why are you eliminating this $837,000; budget constraints?

Mr. HORTON. Budget constraints.

Mr. YATES. Would your records indicate how much we are paying out for black lung disease?

Mr. HORTON. Compensation starting in 1970 totaled $11.7 billion as of October 1981.

Mr. YATES. Does the respirable dust problem payment have anything to do with that?

Mr. HORTON. Yes. We have had some success. We dropped the incidence from 15 percent to 6 percent over the last several years.

Mr. YATES. Does it make sense, therefore, to cut it back by $837,000?

Mr. HORTON. Yes, sir, in light of the budget constraints.

Mr. YATES. Won't we possibly be paying out more later on in black lung payments then?

Mr. HORTON. Possibly.

Mr. YATES. That is a chance that we have to take by reducing this amount of research, right?

Mr. HORTON. Yes, sir.

Mr. YATES. Okay.

You have an interesting statement on page 16, right in the middle of the paragraph:

"Based on a recent NIOSH survey of several industrial sand operations, 50 percent of the current and former workers examined have silicosis."

Fifty percent?

Mr. HORTON. Yes, sir.

Mr. YATES. Is dust a problem with the industrial sand operation too?

Mr. HORTON. Yes. Now that is a very small limited industry.

Mr. YATES. It is a pretty big percentage of the workers though, isn't it?

Mr. HORTON. Within that group, yes. We are doing work in silicosis and on industrial sand in particular.

Mr. YATES. One would think that in view of the prevalence of this scourge you would be increasing your appropriation in order to try to find answers, rather than cutting it back? Wouldn't you think so?

Mr. HORTON. If the funds were available to do so, yes.

Mr. YATES. Well, in view of what is happening to those miners, wouldn't you want to make the funds available to do so?

Suppose you increase the deficit by $837,000, wouldn't you think that would be warranted?

Mr. HORTON. The President has established the priority for the funding.

Mr. YATES. But you are the head of the Bureau of Mines and you know what the conditions are in the mines and with the miners.

Mr. HORTON. The Administration is aware of those factors.

Mr. YATES. Okay. Being aware of that, the Administration has chosen to cut it back by $837,000 rather than increasing that appropriation?

Mr. HORTON. Yes, sir.

Mr. YATES. Okay.

### RADIATION HAZARDS RESEARCH

Let's talk about radiation hazards research. You are cutting back that appropriation too?

Mr. HORTON. Yes.

Mr. YATES. By about 25 percent?

Mr. HORTON. Yes.

Mr. YATES. What work are you eliminating to quantify the sources of radon gas in uranium mines?

Mr. HORTON. The general cutback on the overall program is because uranium mines are closing very rapidly. It is likely that in a few years there will be no underground mines, and only a few open pit mines. The underground mines are those that present a radon hazard.

Mr. YATES. How long will you have to continue a field test on a radiation alarm system?

Mr. HORTON. I would like Mr. Patrick to answer that.

Mr. PATRICK. The radiation program and the testing of that is being done in conjunction with some of the western mines. We are gathering data. We have gotten quite a bit of data, but it is a function of assessing that data and seeing that we are getting representative samples in sampling the mines.

The length of the program, you did ask that question?

Mr. YATES. Yes.

Mr. PATRICK. I would think probably in a year, year and a half we should have it pretty well in hand.

Mr. YATES. Thank you.

### NOISE CONTROL RESEARCH

Let's talk about noise control research. You are reducing that by about a third, right?

Mr. HORTON. Yes.

Mr. YATES. Does that mean that you are going to eliminate projects to determine the levels of whole-body vibration to which the miners are exposed.

Mr. HORTON. Yes.

Mr. YATES. Is that an important program?

Mr. HORTON. It is not a health-threatening one; it is uncomfortable and affects safety by distracting the miner.

Mr. YATES. Is that the only hazard from the noise and vibration to which he is subjected?

Mr. HORTON. That is the whole-body vibration part. I do not believe that refers to loss of hearing.

Mr. YATES. Well——

Mr. HORTON. We feel the noise control is the responsibility of industry, particularly the machine manufacturers.

Mr. YATES. If you look at your justification on page 17, you will find this statement:

"The Bureau's experience over the past several years has shown that while much of the mining industry is willing to adopt noise controls if they are readily available, the industry is unable to provide the resources required to perform long-term research on noise control technology."

Mr. HORTON. We are doing the long-term work.

Mr. YATES. You are doing the long-term work?

Mr. HORTON. We trust them to do the short-term work.

Mr. YATES. I see. You are cutting out the short-term research?

Mr. HORTON. Yes, sir.

Mr. YATES. They are going to take that on? Who in industry is doing that?

Mr. HORTON. Equipment manufacturers.

Mr. YATES. Who among the equipment manufacturers?

Mr. HORTON. Rock-drilling companies.

Mr. YATES. Rock drilling?

Mr. HORTON. The companies that manufacture rock drills, developing mufflers. We have developed some. So much of that must be transferred over to industry.

Mr. YATES. I see. How close to development is that?

Mr. HORTON. There are mufflers available now.

Mr. YATES. Are there?

Mr. HORTON. Noise is almost a continuing thing, as one attempts to continually reduce it.

Mr. YATES. How expensive is the equipment that has the mufflers attached; more than the others?

Mr. HORTON. Yes.

Mr. YATES. Much more?

Mr. HORTON. No, not substantially.

Mr. YATES. Are the small mines going to buy them?

Mr. HORTON. Hopefully.

Mr. YATES. What is your guess?

Mr. HORTON. It is a capital investment—no.

Mr. YATES. Okay. Is any other Government agency doing noise control work of this kind?

Mr. HORTON. I am sure that many agencies are.

Mr. YATES. Do you know of any?

Mr. HORTON. Not in mining.

Mr. YATES. Not in mining?

Mr. HORTON. No, sir.

Mr. YATES. I mean in mining. That is what we are concerned with today?

Mr. HORTON. No.

Mr. YATES. All right.

## SAFETY OF LONGWALL MINING

Do foreign countries have the same regard for the health of the miners that we do?

Mr. HORTON. Many do.

Mr. YATES. Can you give us examples of what they do that we do not do and we should do?

Mr. HORTON. I cannot think of any particular specific. Could you, Mr. Patrick?

Mr. PATRICK. No, sir. We have very good cooperative efforts with the foreign governments. We are quite abreast of what they are doing. There are the differences in the mining.

For instance, in Europe, in coal, a lot of it is longwall. We are just getting into that.

Mr. YATES. Is longwall safer for miners than the practices that we have traditionally used?

Mr. PATRICK. I believe the answer is yes, sir. However, in Europe they are working in a limited area, while our situations are different. Longwall may not be applicable to mining all over the United States.

Mr. YATES. Do they have dust problems in foreign mines?

Mr. PATRICK. Yes, sir, I believe they do.

In the longwalls, the Bureau has done a great deal of research in that area. We have come up with technologies in the past few years as a result of our long-term research that the industries are now utilizing, and we are finding that the dust levels are going down.

Mr. YATES. What is going down?

Mr. PATRICK. Dust levels in United States longwall coal mines are going down.

Mr. YATES. In the longwall coal mines?

Mr. PATRICK. Yes, sir.

Mr. YATES. What about the nonlongwall coal mines?

Mr. PATRICK. In the nonlongwall coal mines, we also have ongoing research. We have a number of research projects both in the way we mine coal and prevent the generation of dust. We have ongoing research to gather the dust after it is generated.

One of the outstanding research areas for the Bureau has been the development of instrumentation that gives us immediate readings.

The situation is improving and hopefully will continue to improve.

Mr. HORTON. Point of clarification.

The longwall miner is safer as regards roof falls, but not concerning dust. The operators have difficulty being in compliance with MSHA regulations. So you balance one against the other.

We are working hard to get the dust under control. In other mining techniques, the mines have not had difficulty staying in compliance. So from a health point of view they do not have the difficulty that the longwall mines have.

## SHEARER-CLEARER FOR LONGWALL DUST CONTROL

Dr. HENRIE. Last year Mr. Marovelli described a procedure on dust control in longwall mines and the procedure was fairly well-developed at that time. They report now that there are 24 faces using that procedure, which does bring longwall much closer to compliance in the dust problem.

Mr. YATES. Let's see what the satellites do. Mr. Murtha was examining that last year.

"Health and Safety Problems of Longwall Mining Equipment, page 588 of part 5.

"Mr. MURTHA. As the coal mining industry progresses, there is an increase in the use of longwall mining equipment. What are the health and safety problems specifically related to longwall mining equipment?

"Mr. KENAHAN. I believe the biggest problem associated with longwall mining is the problem Mr. Marovelli mentioned, the respirable dust problem. And he also stated we are working on that problem. We have come up with at least a partial solution in a very short time.

"During this year and also next year we are emphasizing work on the longwall respirable dust problem.

"Mr. MURTHA. You mean you have reduced the amount of dust which the miners breathe?

"Mr. KENAHAN. That is correct.

"Mr. MURTHA. Substantially?

"Mr. KENAHAN. Substantially. Hopefully we can eventually eliminate all of it."

Kind of optimistic at that point, isn't he?

"Mr. YATES. How do you do that? What do you do about ventilation?

"Mr. KENAHAN. Ventilation will enter into part of the solution that is improvements in ventilation. However, as Mr. Marovelli mentioned, we have a method called the Shearer Clearer where we have added new nozzles to the machines which spray water at the face. We have also placed them in different positions. By simply doing that and controlling the air flow we have reduced the amount of dust at the face by as much as 50 percent. It is a very simple application."

Do you still adhere to that statement?

Dr. HENRIE. That program now has been adopted at 24 different faces.

Mr. YATES. Twenty-four different mines?

Dr. HENRIE. Well, working faces.

Mr. YATES. Faces? I thought you said places.

Dr. HENRIE. Work faces.

Mr. YATES. You mean they use the Shearer Clearer?

Dr. HENRIE. They are using that procedure now, yes.

Mr. YATES. Twenty-four out of how many?

Dr. HENRIE. I do not know.

Mr. YATES. How many mines should be using it?

Mr. HORTON. Total longwall operations?

Mr. YATES. Yes.

Mr. HORTON. Mr. Murphy, do you know?

Mr. MURPHY. Yes, there are approximately 100 longwall faces. The principal problem is with the Double Drum Shearer.

Mr. YATES. The Shearer Clearer?

Mr. **Murphy**. No. The Shearer is the extraction machine. There is one form of that machine that has two cutting heads, one on each head; it is called a Double Drum Shearer.

There are approximately 70 of those machines. At this point roughly one-third of those have been equipped with the Shearer Clearer.

Mr. **Yates**. Well, where the Shearer Clearer is used, has the amount of dust been reduced at the face by as much as 50 percent?

Mr. **Horton**. Yes, sir, in some cases it exceeds that.

Mr. **Yates**. That would be the average then. That is just the spraying of the water with the Shearer nozzle, right?

Dr. **Henrie**. The results are some redirection of the way the ventilation air passed through mining areas.

Mr. **Yates**. Mr. Kenahan says:

"Yes, sir, doing it in a different way from the way it has been done in the past.

"Mr. **Murtha**. It would save $1 billion a year if it works over the long run and once we get the miners subject to the dust over the years out of the mines.

"If you are able to eliminate dust to that level it is a tremendous achievement."

That is Mr. Murtha testifying. Is that statement correct?

Dr. **Henrie**. Yes.

Mr. **Yates**. It has been a tremendous achievement for the people using the Shearer Clearer, right?

Mr. **Murphy**. Yes, sir.

Mr. **Yates**. What happens to the others, they still are subjected to the same amount of dust, those that do not use the Shearer Clearer?

Mr. **Horton**. We are hoping that they will also adopt it as we demonstrate its usefulness.

Mr. **Yates**. How much does a Shearer Clearer cost?

Mr. **Horton**. Not much.

Mr. **Murphy**. Several hundred dollars. Basically, all it involves is reorienting water sprays that are on the machine.

Mr. **Yates**. How long has the Shearer Clearer been in existence?

Mr. **Murphy**. It is an evolving technology. In the places where we have tried it, we have had considerable success. There are other installations where we are still refining it to adapt to those particular faces.

### MACHINE-MOUNTED DUST MONITOR

Mr. **Yates**. Mr. Kenahan also says that in addition to the $10 billion in black lung payments the Government has paid, the miners are paying another $500,000 in insurance premiums each year.

Dr. Enzer says: "We are also working on a machine-mounted dust monitor which will not reduce the dust but will indicate when dust levels become excessive."

You are working on that. What is the progress on that?

Mr. **Horton**. Still working on it, sir.

Mr. **Yates**. Well, is there any progress?

Mr. **Horton**. Mr. Patrick?

Mr. PATRICK. Yes, sir. We have one of the instruments that we are going to use in our laboratories in Pittsburgh for testing.

Mr. YATES. This device might alert the operator to shut down the machine for a certain period of time until the level reaches acceptable proportions.

You have standards of acceptable proportions now, don't you?

Mr. HORTON. Yes.

Mr. YATES. That are subjected to testing in all the mines, right? If the dust accumulates beyond a certain proportion, what do you do, close down the mine? How do you deal with that?

Mr. HORTON. It is illegal to operate in that particular atmosphere. It is a dust exposure. Time function is also involved.

Mr. YATES. What do you do in that case? If they exceed the standard of dust levels, is the mine closed until the dust is cleared?

Mr. HORTON. The miners are sent home, are they not?

Mr. MURPHY. There are administrative procedures to reduce dust levels. The question that you asked in terms of the instrument, the problem basically concerns a field-worthy device that can discriminate between dust particles and water supply, for example.

Of course we are concerned about the exposure to dust levels. As Mr. Patrick indicated, we are continuing to evaluate this device to assure that it measures what we want it to measure.

Mr. YATES. All right. Then Mr. Murtha asks:

"Are there any cutbacks in programs such as this which are so vital in the long run and saving a lot of money?"

Dr. Enzer says: "As far as we know, no. We think these activities will be undertaken."

Mr. Kenahan says:

"Under any circumstances, we would not cut the funding from the respirable dust program."

Mr. Kenahan is no longer with the operation?

Mr. HORTON. No, sir, he is with the Bureau.

Mr. YATES. Is he? Is he here?

Mr. HORTON. No.

Mr. YATES. What does Mr. Kenahan do? What did he do last year?

Mr. HORTON. He was Deputy Director.

Mr. YATES. He is no longer Deputy Director?

Mr. HORTON. That is right.

Mr. YATES. Okay. But Mr. Kenahan thought the Bureau of Mines would not cut the funding for the respirable dust operation. That is not true this year, is it?

Mr. HORTON. No, sir.

Mr. YATES. Let's come back at one o'clock. Have your lunch and we will continue.

Mr. HORTON. Thank you, Mr. Chairman.

Mr. YATES. Thank you.

[Whereupon, at 12:02 p.m., the subcommittee recessed, to reconvene at 1:00 p.m., the same day.]

## AFTERNOON SESSION

Mr. YATES. Okay, Mr. Reporter, show the hearing as coming to order again.

## DIESEL ENGINE EXHAUST RESEARCH

You are cutting back on research for hardware to control harmful exhaust emissions from diesel engines, right?

Mr. **Horton**. Yes, sir.

Mr. **Yates**. Budget constraints?

Mr. **Horton**. Yes, sir.

Mr. **Yates**. Should that research be done?

Mr. **Horton**. Not at this time, we don't believe, with the funding we have.

Mr. **Yates**. Because you don't have the money, that is your reason?

Mr. **Horton**. Yes, sir.

Mr. **Yates**. Who will do the research, then?

Mr. **Horton**. On the diesel work? We will continue doing some, as much as we can afford to fund.

Mr. **Yates**. How much will that be?

Mr. **Horton**. Mr. Patrick may have that?

I think it is $870,000.

Mr. **Yates**. What figure should that be compared with for fiscal year 1982? You say you are cutting back, it can't be the same level.

Mr. **Horton**. We don't have that now.

[The information follows:]

### Diesel Engine Exhaust Emission Control Research Funding

Total diesel engine research funding to control diesel exhaust emissions for fiscal year 1983 is estimated at $870,000 or $180,000 less than the total fiscal year 1982 funding level of $1,050,000. This funding level includes the development of exhaust aftertreatment hardware to control the emission, as well as specific instrumentation development to warn operators of harmful air quality conditions, fuel modifications that alter the composition of the emissions, and an assessment of the influence that the confined underground mine atmosphere has on emission levels.

## VENTILATION RESEARCH

Mr. **Yates**. You are cutting back on investigations of ventilation programs with mines having large cross-sectional airways, right?

Mr. **Horton**. Yes, sir. In the diesel exhaust and ventilation programs, we are gaining funds through some joint efforts with industry.

Mr. **Yates**. Can you describe that for the record? How much will that be?

Mr. **Horton**. We have one now with the Colorado Mining Association that it will fund at $1.6 million.

Mr. **Yates**. How much will they put in, how much will you put in?

Mr. **Horton**. What is our contribution going to be? They are putting in $1.6 million.

Mr. **Murphy**. They are putting in $1.6 million and we, through related proposals, will contribute the same amount.

Mr. **Yates**. 50-50 cost-sharing, then?

Mr. **Murphy**. Yes.

## EXAMPLES OF COST SHARING WITH INDUSTRY

Mr. Yates. How many other examples of cost-sharing can you give the committee where industry is willing to pay half for programs that the Government had fully funded before?

Mr. Murphy. There are a variety of examples where these types of cost-sharing have taken place, one is in the mine-cooling work that we have done for the deep metal mines, where the Bureau did fund the initial research relative to developing a more efficient and more reliable cooler for underground in the hot environment, and there were instances then where two mining companies contributed funds to modify this technology to suit their particular needs.

Mr. Yates. Mr. Murphy, doesn't this kind of cost-sharing generally follow research that has been initiated fully by the Federal Government where industry can see some progress has been made?

Mr. Murphy. In the examples I gave you, sir, that was the case.

Mr. Yates. Isn't that usually the case? What other contracts for cost-sharing do you have in the Bureau of Mines? Can you give us any of those?

Mr. Murphy. As a generic example, sir, we have memoranda of agreement that we enter into with mining companies where they contribute to the overall program. In many cases, there are no funds that exchange hands in those examples, but the mining company does expend funds in terms of preparing facilities and participating in the program.

Mr. Yates. You are the Director of the Pittsburgh Research Center?

Mr. Murphy. Yes, sir.

Mr. Yates. Is that the principal research center for the Bureau of Mines?

Mr. Murphy. It is the largest one, sir.

Mr. Yates. I will accept your choice of words, rather than "principal."

## IMPACT OF BUDGET REDUCTIONS

Is it fair for me to ask you whether your health and safety programs that you have had over the years will be hurt by this cut?

Mr. Murphy. It will change some of the things that we are doing, yes.

Mr. Yates. Are you willing to accept my words? Are you going to be hurt?

Mr. Murphy. I prefer to use mine.

Mr. Yates. I know you do, but would you consider accepting mine? Will you for the moment consider mine and answer my question?

Mr. Murphy. I will answer your question, sir.

Mr. Yates. Are you going to be hurt? The answer is "Yes," obviously. For the record, Mr. Murphy chooses to look up at the ceiling.

How badly will you be hurt, Mr. Murphy?

Mr. Murphy. Well——

Mr. Yates. No, no. Don't look over to Mr. Horton, he is limited by OMB, you are not, are you?

Mr. Horton. Well, an extension of, maybe.

Mr. YATES. Maybe I could ask Mr. Murphy a question. What programs will you have to cut back on?

Mr. MURPHY. I think you can see from the documents you have in front of you that all programs are being affected to some degree——

Mr. YATES. That is what I wanted to find out, whether all programs are being affected. Are some being eliminated and the funds that have been applied to them being used for programs you might consider to be so important that you still want to fully fund them.

Is this the case, or are you cutting them across the board? Do none of them have more importance to you than others?

Speaking as an outsider, I would have thought the dust control programs were particularly important and deserved more attention, than some of the others. Wouldn't you have have thought so?

Mr. MURPHY. Sir, if you look at the percentage changes in programs, you will see that they are not uniform across the board.

Mr. YATES. You don't give that to us. How can we look at it? What do we do, subpoena you?

Mr. HORTON. The dust program is one of the heaviest-financed ones.

Mr. YATES. Why don't you give the committee a list of programs as they are in existence during 1982 and how you propose to cut them back with the cuts in the budget?

Can you do that? That is not in the justification as I read it.

Mr. HORTON. We can supply that.

[The information follows:]

HEALTH AND SAFETY RESEARCH FUNDING, FISCAL YEAR 1982 AND 1983

[Dollar amounts in thousands]

| Program element | Fiscal year 1982 appropriation | Fiscal year 1983 estimate | Change | |
|---|---|---|---|---|
| | | | Dollars | Percent |
| Respirable dust | $4,518 | $4,129 | −$389 | −8.6 |
| Noise control | 2,125 | 1,655 | −470 | −22.1 |
| Industrial hygiene | 2,402 | 1,823 | −579 | −24.1 |
| Ventilation | 752 | 524 | −228 | −30.3 |
| Radiation hazards | 1,016 | 757 | −259 | −25.5 |
| Subtotal, health | 10,813 | 8,888 | −1,925 | −17.8 |
| Fires and explosions | 3,309 | 3,162 | −147 | −4.5 |
| Methane control | 2,112 | 2,019 | −93 | −4.4 |
| Ground control | 11,369 | 10,087 | −1,282 | −11.3 |
| Industrial hazards | 11,195 | 8,474 | −2,721 | −24.3 |
| Post disaster | 1,302 | 1,413 | +111 | +8.5 |
| Explosives | 1,514 | 1,221 | −293 | −19.4 |
| Systems engineering | 4,400 | 2,559 | −1,841 | −41.8 |
| Subtotal, safety | 35,201 | 28,935 | −6,266 | −17.8 |
| Total, health and safety | 46,014 | 37,823 | −8,191 | −17.8 |

Note: This table shows changes between the 1982 appropriation and the 1983 estimate. Some references in the text discuss changes between the 1983 base and the 1983 estimate, and these change percents and amounts differ from those shown on this table.

### BUDGET FOR RESPIRABLE DUST

Mr. YATES. How much money was available for the respirable dust program during fiscal year 1982?

Mr. HORTON. $4,518,000.

Mr. YATES. Then you are cutting it back by roughly $400,000.

Mr. HORTON. Roughly 10 percent.

Mr. YATES. Is this a proportionate reduction in respirable dust to the other programs, with the other programs for health and safety?

Mr. HORTON. Sir, I haven't looked at all the percentages.

### HEALTH AND SAFETY PROGRAMS

Mr. YATES. Let me ask Mr. Murphy; you have in your document with you, Mr. Murphy, a list of all the programs, do you not?

Mr. MURPHY. I am sorry, sir, I don't have a copy of that document with me.

Mr. YATES. Don't you know what your programs are?

Mr. MURPHY. Yes, sir, but I can look at Mr. Patrick's, I do not have one with me.

Mr. YATES. How many programs are we talking about?

Mr. MURPHY. In the health and safety area? We are considering respirable dust——

Mr. YATES. Give me numbers first of all, would you?

Mr. MURPHY. Twelve.

### HEALTH AND SAFETY BUDGET REDUCTIONS

Mr. YATES. Does your memory permit you to tell us what is the percentage cut in respirable dust?

Mr. HORTON. I believe I can answer that.

Mr. YATES. We know what the dollar cut, the dollar cut is approximately $400,000, isn't it?

Mr. HORTON. Yes.

Mr. YATES. Okay. What I am trying to find out is you have a total cut of $9,467,000 for all these health and safety programs; the health and safety programs were cut back by what proportion?

Mr. OYLER. That is all health and safety.

Mr. ENZER. Twenty percent from the previous year.

Mr. YATES. Twenty percent from the previous year, okay.

Was respirable dust cut back 20 percent?

Mr. HORTON. Nine percent, approximately.

Mr. YATES. Would you identify the other health and safety programs and tell the committee what was the percentage cut in each?

Mr. HORTON. We don't have the percentages, but I have the amounts.

Mr. YATES. Would you compare the amounts for 1983 with those for 1982?

Mr. HORTON. For noise control, the 1982 was $2,125,000; and the cut——

Mr. YATES. The comparable figure for 1983 is what?

Mr. HORTON. $1,655,000.

Mr. Yates. Next. You are going down 12 programs, as I understand it right now, because your associate on your left said you had 12 programs in this overall category.

Mr. Horton. Mr. Chairman, we are having to do some addition, because we have, in our particular records, coal separate from metal and nonmetal in our programming and planning.

So we are having to add them.

Mr. Yates. Are your health and safety programs applicable to all kinds of mines or just coal?

Mr. Horton. No, it is applicable to all types of mines.

Mr. Yates. All types of mines, okay.

Mr. Horton. But that is not true across the board. We make a distinction in some of the funding between coal mines and metal and nonmetal mines.

But much of the work done in coal mines is applicable to nonmetal mines. But one particular program addressed this morning, the Shearer Clearer, longwall, that is applicable only to coal mines.

There are others applicable to other than coal mines.

Mr. Yates. I know.

Mr. Horton. In budgeting, we are planning the programs for which we make differences: that which is specific coal, that which is specific metal and nonmetal. But there are other factors such as noise control, ventilation, industrial hygiene.

### BLACK LUNG COMPENSATION PAYMENTS

Mr. Yates. We have trouble following all this. Obviously this committee is interested in the research into health and safety. This morning it was indicated that we paid out $11.7 billion in black lung benefits, as you know, and the respirable dust program could provide a way to minimize these payments in the future.

It is interesting to read your justification and try to reconcile that with a reduction in respirable dust.

I read from your justification, "The cost of this compensation, starting since 1970, has totalled over $11.7 billion as of October 1981 and continues to cost in excess of $1 billion annually. The prevalence of silicosis among surface mine workers may be more serious than previously thought. Based on a recent NIOSH survey of several industrial sand operations, 50 percent of the current and former workers examined have silicosis."

Fifty percent of those workers have silicosis.

Then it goes on to say, "Of these, 10 percent have an advanced stage of the disease known as progressive massive fibrosis." You go on to say, "If this is an indication of conditions existing in the remaining operations, both surface and underground, positive action must continue to be pursued so that the health of the active and incoming workforce can be protected."

Then you go on to pat yourself on the back by saying, "The Bureau has been and continues to be active in research on silicosis prevention," and then you come before us now with a reduction in the budget for this program of approximately $900,000.

It seems to me you are marching backwards instead of forwards for dealing with this problem.

The only reason you can give is budget constraints.

Mr. HORTON. Yes, sir.

Mr. YATES. Again, I ask you, here but for the grace of God sits you on this side of the table. How would you vote on the question of putting this money back in for respirable dust?

How do you vote? Do you put the money back in?

Mr. HORTON. No, sir.

Mr. YATES. You don't.

Mr. HORTON. No.

Mr. YATES. Why don't you? I am talking about this side of the table, not your side.

Mr. HORTON. Oh, your side. Perhaps I am not as familiar with the problems on your side of the table, but I know those on my side.

Mr. YATES. Okay. You got a deal with OMB, don't you?

Mr. HORTON. I assume——

## VIEWS OF UNITED MINE WORKERS

Mr. YATES. You don't have to deal with coal miners, do you?

Mr. HORTON. Yes, sir.

Mr. YATES. Do you?

Mr. HORTON. We work with them every day.

Mr. YATES. I see. What's been their reaction to your cutback on the program for respirable dust research?

Mr. HORTON. I haven't——

Mr. YATES. You haven't asked them.

Mr. HORTON. No.

Mr. YATES. Do they know about the cutback?

Mr. HORTON. I presume they do, yes, sir, it's been published.

Mr. YATES. They haven't mentioned it?

Mr. HORTON. Not to me.

Mr. YATES. I see. Who would they mention it to? Would they mention it to Mr. Murphy?

Mr. HORTON. They might.

Mr. YATES. Mr. Murphy, have they mentioned it to you?

Mr. MURPHY. No, sir.

Mr. YATES. They have not.

Mr. MURPHY. No.

Mr. YATES. Have you mentioned it to them?

Mr. MURPHY. No, sir.

Mr. YATES. I must say that there certainly seems to be little communication between you.

Mr. HORTON. I would——

Mr. YATES. Let's talk about what the coal miners think. I have a letter from Danny Davidson, Deputy Director of the Mineworkers, and here is their comment on the budget cuts.

The "Nation's coal mines have long represented the most hazardous working environment in American industry. While this reputation remains in tack, significant reductions in fatals have occurred in the last decade. The number of fatals has fallen from 260 in 1970 to a low 106 in 1978. This reduction can, in part, be attributed to the Mine Safety and Health Act and in particular, to the work accomplished by both the Mine Safety and Health Administration and the Bureau of Mines personnel. In recent years the fatal trend has reversed, 133 in 1980, 155 in 1981. We find this to be very disturbing. Mining itself promises to become more hazardous in the future as companies continue to pursue resources that lie deeper, that are faster and, in general, more difficult to mine.

"Furthermore, the work force is dramatically changing and younger, more educated personnel presenting both management and union leaders with new challenges in maintaining a stable work force that will work safely.

"We face today, a condition in the coal fields that promise to increase the cost of human life and suffering in the future."

I will put this into the record.

[The information follows:]

United Mine Workers of America,
*Washington, D.C., March 22, 1982.*

Hon. Sidney Yates,
*Rayburn House Office Building,*
*Washington, D.C.*

Dear Congressman Yates: Please find enclosed, for your information, a copy of the United Mine Workers of America coments on the budget cuts in the Bureau of Mines, Research Department.

Should you need any additional information, please contact me in my office.

Sincerely,

Danny C. Davidsion, *Deputy Director.*

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U.M.W.A.

## Testimony on Budget Cuts-Bureau of Mines Research Department

Our Nation's coal mines have long represented the most hazardous working environment in America's industry. While this reputation remains in tack, significant reductions in fatals have occured in the last decade. The number of fatals have fallen from 260 in 1970 to a low 106 in 1978. This reduction can, in part, be contributed to the Mine Safety and Health Act and in particular, to the work accomplished by both the Mine Safety and Health Administration and the Bureau of Mines personnel. In recent years the fatal trend has reversed (133 in 1980—155 in 1981) as we find this to be very disturbing. Mining, itself promises to become more hazardous in the future, as companies continue to pursue resources that lie deeper, that are faste, and in general, more difficult to mine. Furthermore, the work force is dramatically changing and younger, more educated personnel presenting both management and union leaders with new challenges in maintaining a stable work force that will work safety.

We face today, a condition in the coal fields that promises to increase the cost of human life and suffering in the future. If strong action is not taken now, it is disconcerting that both of the Federal agencies that have had a positive impact on the industry's accident rate, have become targets for both personnel and budget cuts. It was reassuring and concerning to note that MSHA have profitted from the recent disasters and have had its budget increased.

The Bureau of Mines remains a target for both personnel and budget cuts proposed for fiscal year 1983. Specifically, the Administration fiscal year 1983 budget reduces the Bureau's funding level from 55 million for fiscal year 1982 to 46 million for fiscal year 1983; Personnel levels have also been portionally reduced. The Bureau efforts are also being redirected to abandon short term projects in favor of long term, high rish ventures. This action will further reduce the agency's effectiveness. We strongly urge you to consider the affect of budget cuts of the only mining research organization capabale of addressing that industry's problems. From where are the solutions to come—if not from research?

### ROOF-BOLTING RESEARCH

Mr. YATES. At any rate, that is the attitude of the coal miners. You haven't found that to be true? Have you talked to the mine workers at all?

Mr. HORTON. Not regarding the budget, no.

Mr. YATES. Aren't they interested in the budget? I would think they would be, wouldn't you?

Mr. HORTON. I have been here 7 months and have not spoken with the mine unions.

Mr. YATES. Well, how important is research on the roof-bolting of the mines? Were there any cave-ins last year?

Mr. HORTON. Yes, one of the accidents about the same time as the explosion was the roof fall. Roof falls are not uncommon.

Mr. YATES. They are not. So the roof-bolter is important and research is important on roof-bolting?

Mr. HORTON. Yes, sir.

Mr. YATES. Why are you cutting back on it, then?

Mr. HORTON. In order to meet the budget requirements of the Administration.

Mr. YATES. Okay.

Mr. HORTON. We continue roof-bolting work, of course.

Mr. YATES. What is the difference between the appropriations for 1982 and 1983 for roof-bolting research?

Mr. HORTON. Just one moment.

In 1982, the budget for ground control, which is roof-bolting plus other structure problems of a similar nature, the appropriation in 1982 was $11.3 million. We requested $10.1 million.

Mr. YATES. Would you give me that again?

Mr. HORTON. The 1982 budget was $11.3 million; our 1983 request is $10.1 million, a difference of $1.2 million.

Mr. YATES. You have read this book, "Bureau of Mines Research for 1981."

Mr. HORTON. Yes, sir.

Mr. YATES. On page 57 of that book, it talks about roof-bolting. "Roof-bolter operators incur about one-third of all accidents, even though they represent less than 15 percent of the total mine work force."

Will the cutback in this program affect that percentage?

Mr. HORTON. I would hope not.

Mr. YATES. I would hope not, too.

Mr. Murphy, what is your guess, would the cutback in this program affect the roof-bolters, the probability that roof-bolters will have more or less accidents?

Mr. PATRICK. No, sir, not the specific roof-bolters. We have ongoing projects in which we are testing roof-bolters with industry and that will continue.

However, there probably will not be additional research done on that.

In other words, we will continue the research that we have ongoing.

Mr. YATES. Are you making a reduction or stretching out the research over a longer period of time?

Mr. PATRICK. In some instances, we are stretching it, yes, sir.

**Mr. Yates.** You have no alternative except to do that. Isn't the research important enough to justify keeping the program intact by additional funding or is that a leading question?

[Discussion off the record.]

### CRITERIA FOR HEALTH AND SAFETY REDUCTIONS

**Mr. Horton.** Mr. Chairman, lest I leave the impression for the record that these were wild and inconsiderate cuts, there were many relative criteria that we considered in establishing these budgets.

I might direct your attention to page BM-19 in our submittal and on page 20 where we have discussed some of our criteria, some of the reasons and some of the reductions as a result of the reasons.

If I might enter this.

**Mr. Yates.** What do you want to enter?

**Mr. Horton.** The criteria on BM-20.

**Mr. Yates.** Surely, you can put that in the record. You want to put the top of BM-20 into the record, then? I would be glad to.

**Mr. Horton.** The bottom two paragraphs on 19 and the top of 20.

**Mr. Yates.** Sure. I have been reading from your budget, sure.

**Mr. Horton.** That explains this, I believe.

[The information follows:]

### Factors Considered in Health and Safety Project Selection

1. Reduction of technology demonstrations and retention of technology development.
2. Ability to maintain progress toward objectives at lower level of funding.
3. Completion of a phase of a project allowing convenient milestone to evaluate results and/or defer work.
4. Deferment to evaluate probability of industry pick up of the research.
5. Convert contract activity to in-house as part of trend toward more fundamental or long-term research.
6. Elimination of projects with high cost relative to benefit.
7. Termination of recently indicated projects in which the investment to date is small, thereby cutting the loss.

**Mr. Yates.** We have been reading from BM-16 on respirable dust. It is very interesting.

### HISTORY OF FISCAL YEAR 1983 BUDGET REQUEST

Let's look at your fiscal year 1983 budget request history. For all your work, you requested $149,585,000 from the Department, right?

**Mr. Horton.** Yes, sir.

**Mr. Yates.** For fiscal year 1982, the figure agreed upon was $145,885,000.

You asked the Department for $3 million more approximately, $149,585,000 for 1983, and the Department cut you back by approximately $7 million, right?

**Mr. Horton.** Yes, sir.

**Mr. Yates.** They sent you to OMB with a figure of $142,642,000.

Lo and behold, when your request came out of OMB, you had been cut back by another $18 million. OMB approved a total budget of $124,676,000 for the Bureau. That is broken down by $37 million that we have already discussed for minerals health and safety.

Your request for minerals and environment technology had been cut by $5 million by the Department itself, OMB gave the same figures the Department issued. Mineral resources technology, you wanted $35 million and that was cut by $2 million. OMB approved a $2 million cut.

### DATA COLLECTION AND ANALYSIS BUDGET REQUEST

Then minerals information, data collection and analysis, you wanted $23,549,000, the Department thought so well of that, they gave you another million dollars, didn't they?

But OMB said, "No, sir, you can't have that," and they cut you back by more than $4 million on that.

Apparently OMB doesn't think your data collection and analysis is as important as you think it is, right? $4 million.

What is cut out of data collection and analysis, then?

Mr. **Horton**. Dr. Enzer.

Dr. **Enzer**. There are some projects that we are slowing down, Mr. Chairman. We are not really cutting out anything.

Mr. **Yates**. You are cutting $4 million of work out.

Dr. **Enzer**. Yes.

Mr. **Yates**. What is represented by the $4 million, Dr. Enzer?

Dr. **Enzer**. We are developing a critical minerals index.

We are working, as you know, on a minerals availability system where we develop information on the major mines in the United States and all over the world and these projects are still going on.

Mr. **Yates**. Is that very important?

Dr. **Enzer**. Yes, it is.

Mr. **Yates**. Why are you cutting back on it, then?

Dr. **Enzer**. As you read from the sheet, we are not cutting back.

Mr. **Yates**. Something is being cut back by $4 million, Dr. Enzer.

Dr. **Enzer**. We are going at a slower pace than we wanted to.

Mr. **Yates**. Why did you establish the first pace, then? If it is not that important, shouldn't you continue on your original schedule if it is important?

Dr. **Enzer**. You read from the sheet, Mr. Chairman, and you can see what we asked for and what the Department gave us.

Mr. **Yates**. Yes. The Department said you were important, didn't they?

Dr. **Enzer**. Yes.

### MINERALS AVAILABILITY SYSTEM

Mr. **Yates**. What's being stricken out? Are you phasing it out over the year? What will the $4 million cut do to you, Dr. Enzer?

Dr. **Enzer**. The minerals availability system is being affected and the critical mineral index is being affected. We also wanted to develop a demand structure that would go along with the supply curves for these mines and this is probably the project that will not be started at this time.

So the minerals availability system, and the critical minerals index, will be slowed down.

Mr. **Yates**. By how much, Dr. Enzer?

Dr. **Enzer**. By about 1 to 2 years.

Mr. **Yates**. If you are cut back next year, it will be even longer, won't it?

Dr. **Enzer**. It will be a bit longer, yes.

Mr. **Yates**. What is the importance of that project? Why is that important?

Dr. **Enzer**. Mr. Chairman, you listened very carefully to Dr. Morgan this morning and you saw all his charts; what we are trying to do is to arrange some of the things that you saw in a more systematic manner and to——

Mr. **Yates**. More systematic than Dr. Morgan presented it?

Dr. **Enzer**. It may sound incredible, but what we are trying to do is to take some of these commodities and to assess the likelihood of a disruption in each case and then determine what would happen to the U.S. economy if cobalt, for example, were cut by 50 or 80 percent.

Mr. **Yates**. Why does that have importance if cobalt were cut by 80 percent; what would that do to us?

Dr. **Enzer**. That is what we would like to find out.

Mr. **Yates**. I see. Is that of importance?

Dr. **Enzer**. Yes, sir, because one of the things we can determine for a given disruption is what happens in the way of economic impact. We then can use this to determine which of these commodities we ought to buy first and meet the stockpile goal.

Mr. **Yates**. That would seem to have some importance, wouldn't it?

Dr. **Enzer**. Yes.

Mr. **Yates**. Do you agree with that, Dr. Morgan?

Dr. **Morgan**. Yes, sir.

Mr. **Yates**. Do you agree with that Mr. Horton?

### HISTORY OF BUDGET REQUEST FOR DATA COLLECTION AND ANALYSIS

Mr. **Horton**. Yes, there is an increase, a slight increase in our budgets from 1981 to 1983 for data collection analysis.

Mr. **Yates**. What does this cutback represent, then?

Mr. **Horton**. That is the OMB cutback on the request.

Mr. **Yates**. Then there is a decrease. You come to us with a decreased request, don't you?

Mr. **Oyler**. Mr. Chairman, you were discussing what the OMB had cut out.

Mr. **Yates**. Yes. That is what you are asking us for.

Mr. **Oyler**. Our budget request for 1983 in this area is no program change from 1982.

Mr. **Yates**. What is the request for before this committee? You are asking for $20,408,000.

Mr. **Horton**. Yes.

Mr. **Yates**. That is a program change.

Mr. **Oyler**. The same level as the 1983 base.

Mr. **Yates**. What you are saying isn't really in point, is it? You're asking us for a $4 million cutback from last year's level for this.

Mr. **Horton**. No.

Mr. **Oyler**. No, sir. That is not quite correct.

Mr. **Yates**. Let me go over it again. As I read these figures, you ask the Department for $23,549,000. Right?

Mr. **Horton**. Yes.

Mr. **Yates**. The Department gave you more money than you asked for.

Mr. **Horton**. Yes.

Mr. **Yates**. They gave you another $1 million. OMB, however, changed that figure. They cut out almost $4 million, didn't they?

Mr. **Horton**. Yes. The net result of that was to maintain the program after the OMB cutback, maintain the program at the same level as the previous year.

Mr. **Yates**. Oh, I see your point. Your point is that you were allowed $20 million in 1982.

Mr. **Oyler**. Yes. You were asking what we asked OMB for.

Mr. **Yates**. So OMB said you were lucky to get the same thing you got in 1982. Yes, yes, I understand, budget constraints. I've heard you.

Mr. **Horton**. Well——

Mr. **Yates**. What does this do to your planning, Dr. Enzer?

Dr. **Enzer**. Well, I did mention to you, Mr. Chairman, that for these three projects, two of them will be slowed and one of them may not be started at this time.

Mr. **Yates**. How long have you been building up to ask for this money? Have you been waiting for a while?

Dr. **Enzer**. I don't understand your question, sir.

Mr. **Yates**. How long have you waited before you were able to get the additional $3 million or $4 million from the Department to carry out the program?

Dr. **Enzer**. Well——

Mr. **Yates**. How many years have been in planning for these programs?

Dr. **Enzer**. Oh. Well, in the mineral availability system, the program was started and funded around 1972 or 1973; and the minerals index work was started in 1978. We asked for the increase because we believe the sooner we have them in place, the better off we would be and so we did——

Mr. **Yates**. Who is "we"?

Dr. **Enzer**. The Bureau of Mines——

Mr. **Yates**. —and the country?

Dr. **Enzer**. And the country.

Mr. **Yates**. —would be better off. Okay.

So the country won't be better off now?

Dr. **Enzer**. The country will have to wait a little longer.

Mr. **Yates**. So will the Bureau of Mines?

Dr. **Enzer**. Yes.

Mr. **Yates**. Okay.

### LAND ASSESSMENTS BUDGET REQUEST

Then we have land assessments and the Department was asked for $10,187,000, the Department didn't like that one at all, cuts you back by $5 million and OMB says, "That's fine, we will accept the $5 million cut."

What is the effect of the cut? How much did you receive in 1982?

Mr. HORTON. $9,400,000.

Mr. YATES. $9.4 million. You wanted another million dollars and you got cut in half, back to $5.4 million.

Mr. HORTON. No, no——

Mr. YATES. Yes.

Mr. HORTON. We had spoken about that earlier today, Mr. Chairman. Despite the amount of that cutback, the program is a level program, as we wind up our work in the Forest Service.

Mr. YATES. That is right. This is the wilderness and the RARE II.

Mr. HORTON. Yes.

Mr. YATES. General administration, not much change.

### HISTORY OF PERSONNEL REQUESTED

Pay supplemental, $1.5 million down the drain there.

Let's look at your personnel now. For fiscal 1982 you requested the Department to give you 3,083, the Department approved it, OMB cut you back by 83——

Mr. OYLER. 82.

Mr. YATES. 82 what?

Mr. OYLER. 82 full-time equivalents, staff years.

Mr. YATES. Now we come to 1983 and you asked the Department for 2,990, that cut back, excuse me, to 2,962. OMB cut you back by another couple hundred.

What are you going to do for making up for loss of personnel? Is this attrition or RIF, too?

Mr. HORTON. We will not have to have a RIF unless things change unusually. Our attrition rate is matching the goal.

Mr. YATES. What happened to the work that was done by the attrited people?

Mr. HORTON. Some of it was handled by contract, some with decreasing budgets, the people match the dollars.

Mr. YATES. If you do it by contract, what is the saving?

Mr. HORTON. The dollars that we have been discussing are the savings; with the decreasing budget, we do not need the larger staff. We will probably be doing some contracting.

### CONTRACT VS. INHOUSE RESEARCH

Mr. YATES. Let's turn to BM-44 of your justifications. You are cutting out 17 mineral resources people: is that correct?

Mr. OYLER. That's correct, Mr. Chairman.

Mr. YATES. You are increasing other services by $2,098,000. What is the difference in the cost of the 17 people and the other services? Are you going to have to contract above and beyond the 17 people that you had before.

Mr. HORTON. Yes, sir.

Mr. YATES. By what amount?

Mr. HORTON. By $2 million, these other services.

Mr. YATES. What is the advantage? Is there an advantage in cutting people from the payroll and putting the funds into outside contracting?

Mr. HORTON. It can go both ways. The advantage is that it gives you some diversity in the type of work that you do and it is easier to start up and shut down with a contract, obviously.

Mr. **Yates**. You won't have any people at all except the contracting people, will you?

Mr. **Horton**. Pardon?

Mr. **Yates**. Why have any people at all working for you except the contracting people to let the contracts? If this is true, why don't you just put the whole program out to private industry and let private industry do all the work?

Dr. **Morgan**. Could I answer that question?

Mr. **Yates**. You may, indeed, Dr. Morgan, as soon as I finish the question.

You drove the question from my mind. I don't think that was your purpose.

Dr. **Morgan**. I apologize.

Mr. **Yates**. Under your theory, all you need is contracting officers and a few people to say, "This is what we need. Let's get private industry to give us all that information."

Dr. Morgan, the floor is now yours.

Dr. **Morgan**. I would say, sir, from the historical perspective, that is exactly what happened in the Defense Department and in several of the military services. They did away with the technical services that knew what they were doing, they did away with many of the in-house laboratories and they went extensively to outside contracts.

Mr. **Yates**. What years are we talking about now?

Dr. **Morgan**. Oh, the last 30 years, over the whole period.

What has happened, and I have heard people in the senior echelons in the Defense Department say this today, is they have so cut their in-house capability that they don't even know what questions to ask or what contracts to make.

Mr. **Yates**. Right.

Dr. **Morgan**. Therefore, one reason why we have to have technically competent people in Government agencies is to know what the problems are, what contracts to make, and how to supervise them.

Mr. **Yates**. And to know whether or not the people with whom you contracted did a decent job.

Dr. **Morgan**. Right. And in other areas of Government, they have carried this outside contracting so far as to emasculate the possibilities of getting intelligent scientific work.

Mr. **Yates**. But that is not going to happen in the Bureau of Mines, is it?

Dr. **Morgan**. I trust not.

Mr. **Yates**. Do you trust not, sir?

Mr. **Horton**. I will work very hard to make sure it is not.

Mr. **Yates**. Would you be better off with the 17 employees? Suppose the committee thought you ought to keep some trained personnel around, and thought perhaps instead of cutting back 17 employees in this important activity, that the Department ought to keep them?

Mr. **Horton**. It is part of the President's goal to reduce Federal employment by 75,000 and we are taking our share.

Mr. **Yates**. That assumes the President's right in everything he is doing, doesn't it? "Theirs is not to reason why. Theirs is but to do or die." Isn't that a poem?

Mr. HORTON. Charge of the Light Brigade.

Mr. YATES. Into the Valley of Death.

### OMB CIRCULAR A-10

You know the problem we have? I had the same problem with the Department of Energy the day before yesterday. OMB has made it so difficult for the Congress to act that I think the whole country is going to suffer. The whole Federal Government is going to suffer.

You are aware of the OMB directive A-10?

Mr. HORTON. Yes, sir.

Mr. YATES. Are you aware of what Mr. Davis, Deputy Director of the Department of Energy, did to implement that?

Mr. HORTON. No.

Mr. YATES. Listen to what Mr. Davis did, he talked about this circular.

He says, "This memorandum, dated March 29, 1982, amends paragraph 4.d of Circular A-10 to prohibit witnesses from providing plans for the use of appropriations in excess of the President's request.

"In carrying out these instructions, the Department will interpret this prohibition to encompass both written and oral responses to questions raised by Members of Congress or their staffs in hearings, meetings, correspondence or by telephone. It will also include inserts and answers to Member and staff questions to be provided for the record subsequent to a Congressional hearing, all Congressional requests for capabilities statements, and all other Congressional requests, formal and informal, for information on the use to which appropriations in excess of the President's request would be put.

"An exception to this prohibition is responses to questions dealing with what the Department requested from OMB or what was requested in the Department's internal review budget. These questions may be answered even though the data provided could be interpreted as a plan to increase the President's Budget. Where appropriate these answers should include a statement of support for the President's Budget."

Well, you have carried that out. Where does that put us in the Congress? We too have some responsibility in trying to make sure that the Bureau of Mines operates at a decent level.

By "decent level," I don't mean the OMB level necessarily, but I mean a level that will permit the work of the Bureau of Mines to carry out its functions and responsibilities as was intended by Congress in passing the legislation creating the Bureau of Mines.

If you are deprived of the life's blood for your operations, which is the funding to carry on your operations, aren't you in a sense, negating the congressional mandate?

Mr. HORTON. It would be. If I felt that way, I would have to take some action, but——

Mr. YATES. What action could you take?

Mr. HORTON. Well, one in my position has but two actions.

Mr. YATES. Either resign or——

Mr. HORTON. Stay or leave.

Mr. YATES. To stay or to leave. Okay.

Do I take it you are going to stay?

Mr. HORTON. Yes, sir.

Mr. YATES. Based on that answer, that would indicate that you believe that this budget is adequate to carry on all the responsibilities of the Bureau of Mines?

Mr. HORTON. I believe I can be most effective in assisting the mining industry and the Bureau of Mines by staying.

Mr. YATES. The answer to my question is yes, then?

Mr. HORTON. Yes.

### COMMITTEE SOURCES FOR PROGRAM INFORMATION

Mr. YATES. Are you allowed to tell the committee where the committee should go for additional information as to how to make the Bureau of Mines more effective? Where should the committee turn for expert witnesses on the subjects with which the Bureau of Mines deals?

On advice of counsel, you are pleading the fifth amendment?

Mr. HORTON. No, sir. I would be pleased to answer any direct question.

Mr. YATES. I am asking you a direct question. I am asking you from what sources should the committee obtain information relating to the work of the Bureau of Mines, other than from the personnel of the Bureau of Mines itself?

Mr. HORTON. Bureau of Mines personnel would be the best place to start.

Mr. YATES. All right. What other sources are there?

Mr. HORTON. As to the specific work of the Bureau of Mines?

Mr. YATES. Yes. I don't think you people are being allowed to give us full answers. You are proscribed, prohibited from telling us what the impacts of this would be. The Congress in its wisdom might say: "That is crazy, you can't cut out that money." I am sure Mr. McDade is going to say: "You can't cut out the money for subsidence research."

Mr. HORTON. On direct request, we can provide the information utilized in developing our budgets.

Mr. YATES. Do you, by any chance, have the same kind of a directive that the Department of Energy has in the Davis letter?

Mr. HORTON. That letter.

Mr. OYLER. We do have the revised version of A-10 and we have some Department guidelines from our Department also. But our Department guidelines speak more to our previous position of defending the budget, of course, as members of the Administration; pointing out differences in levels of responsiblity. But we certainly would not want to give any impression that we could not be responsive to questions of the committee in oral testimony or for written statements on capability, or impact, et cetera.

Mr. YATES. All right. How much more direct can I be than in the question I have asked you, What possible sources of information can we go to? Who do we go to, what companies do we go to, what organizations do we go to? With whom do you work that would know about the operations of the Bureau of Mines?

Mr. HORTON. We work with the National Academy of Sciences in several areas and the National Materials Advisory Board. Both the National Materials Advisory Board and the National Academy of Sciences have studied our operations at our request and submitted reports concerning proper prospects for project planning.

Mr. YATES. Are they familiar with the uses to which you put your budget?

Mr. HORTON. Generally, yes, in the areas they have studied.

Mr. YATES. What industries and what other companies should we go to that are familiar with your operations? I know the coal companies are.

Mr. HORTON. The coal companies, the American Mining Congress in a general sense, State geologists, National Coal Association. The specific program material should be requested through the Department from the Bureau.

METHANE CONTROL TECHNOLOGY

Mr. YATES. In 1980 you began a program to develop methane control technology for oil shale and salt mines. Can you tell the committee how much you have invested to date in research?

Mr. PATRICK. The estimate I would have would be about $1 million.

Mr. YATES. About $1 million. How important is that research, Mr. Patrick?

Mr. PATRICK. The industry, like many other industries, is in a downturn, economically speaking. We have had to prioritize our work and we have slowed that down.

Mr. YATES. Your justification says that applied research will be eliminated?

Mr. PATRICK. Yes, sir.

Mr. YATES. Do you have any idea as to when the research is going to be brought to a successful conclusion?

Mr. HORTON. There are mining companies now that are doing draining; there are some that are selling the gas.

Mr. YATES. Have you had demonstrations in shale and salt mines?

Mr. HORTON. In a salt mine, yes. We have an experimental shaft in oil shale.

Mr. YATES. Why is the applied research being eliminated?

Mr. MURPHY. The answer is, some of the more fuel-applied type research is being eliminated, looking at fundamental investigations of how methane is captured in salt or oil shale and how it migrates.

Mr. YATES. What is the difference between that and applied research?

Mr. MURPHY. Some of the questions of how you would actually remove the gas from the mine and demonstrations of the removal techniques would be more toward the applied spectrum.

Mr. YATES. Safety hazard reduction, you are cutting back more of the work, saying it is to be done with in-house capability, right, in safety hazard reduction?

Mr. HORTON. Yes.

### HEADQUARTERS AND FIELD PERSONNEL REDUCTIONS

Mr. **Yates**. Yet you are cutting back the staff about 25 percent; that's correct, too, is it not?

Mr. **Horton**. Yes, Mr. Chairman.

Mr. **Yates**. So that means that the staff that remains will have to be much more capable, won't they? This is what you call streamlining.

Mr. **Horton**. That is one word for it.

Mr. **Yates**. Somebody from the BLM, when asked a similar question, said, "Mr. Chairman, we will have to be smarter." I assume these people will have to be smarter to handle all that work.

Mr. **Horton**. We will keep the good thought.

Mr. **Yates**. Will your reductions be at headquarters or in the field?

Mr. **Horton**. In both, sir.

Mr. **Yates**. In what percentages?

Mr. **Horton**. Largely in the field.

Mr. **Yates**. The reductions would take place in the field?

Mr. **Horton**. Yes.

Mr. **Yates**. Then you are going to keep the Washington staff and take reductions in the field?

Mr. **Horton**. We have very few in Washington and have already made some reassignments in that.

### MINERALS ENVIRONMENTAL TECHNOLOGY

Mr. **Yates**. Minerals environmental technology is being reduced from $10.6 to $6.2 million. Do you have anything to do with acid rain?

Mr. **Horton**. No, sir.

Mr. **Yates**. Thank heavens for that, right?

Mr. **Horton**. Yes. In a very indirect fashion. In the past we have done some work on emissions. Emissions are the key source of acid rain.

### TRI-STATE PROJECT

Mr. **Yates**. Last year, Congress provided funds for a demonstration program to protect the public from hazardous conditions resulting from past mining of lead and zinc in Kansas, Missouri and Oklahoma. What progress has the Bureau of Mines made in dealing with this problem?

Mr. **Horton**. Mr. Meikle.

Mr. **Meikle**. Sites are now being examined in the Galena, Kansas area; four sites on privately owned property are now under examination. That demonstration will commence in this fiscal year. We plan to have it terminated in 1983. Those were 1982 funds.

Mr. **Yates**. How much money is budgeted for the work in 1983?

Mr. **Meikle**. I would estimate—those are 1982 funds; I would estimate that——

Mr. **Oyler**. Nothing new.

Mr. **Yates**. How are you going to finish it if you don't have any money in 1983?

Mr. **Horton**. The funds have been carried over.

Mr. **Yates**. Can you carry that money over?

Mr. **Oyler**. The $500,000 project, Mr. Chairman, will be a self-contained effort.

Mr. **Yates**. How much money do you need to complete the program? We allowed $500,000 for the program last year. Is that enough to complete the program?

Mr. **Meikle**. $500,000 is sufficient to do what we have in mind, that is, demonstrating the closure of shafts in that lead-zinc district.

Mr. **Yates**. Does that complete what Congress had in mind?

Mr. **Meikle**. That is what the scope is, as now interpreted, for that $500,000?

Mr. **Yates**. What will you be doing with the $500,000?

Mr. **Meikle**. It involves—our approach is to design devices to plug the upper several feet of open shafts. There are several thousand of those in that area, by the way. Under consideration right now are the design of devices, concrete shapes, irregular concrete shapes. These will be used in a structural fashion to provide a plug in the upper 10 or 15 feet of certain of those open shafts.

Mr. **Oyler**. If I might, I think the record will show that we were considering for the 1982 program and providing information to the committee at your request, for an $800,000 project. The final appropriation was $500,000.

Mr. **Yates**. Because that is all you could use in 1982?

Mr. **Oyler**. There were some questions of exactly when the contract could be let. As Mr. Meikle has said, we now plan to let it in 1982. But it was a somewhat larger problem and program when it was discussed last year.

Mr. **Yates**. What is being eliminated in the program? What will you not be spending from the program?

Mr. **Oyler**. Subject to correction, I think it is just a smaller scale effort.

Mr. **Yates**. Will the smaller scale effort provide all the information that Congress had in mind?

Mr. **Meikle**. The hazards in that particular area that we are talking about are certain unattractive nuisances, such as pits containing water, subsidence events in that area and there are open shafts. In the lead-zinc belt or district of Oklahoma, Kansas and Missouri, there were approximately 6,000 shafts put down including prospecting shafts; about two-thirds of them in Oklahoma and in Kansas are still open, providing the possibility of accidents. Only 10 percent of the shafts in Missouri are still open.

As I mentioned before, we are currently examining four sites near Galena, Kansas. Due to the appropriations Mr. Oyler mentioned, the appropriations for this work was reduced to $500,000 and it was decided to cut that scope back to examine shafts only, in that shafts represent, in our judgment, the biggest single hazard.

### MINE LAND RECLAMATION PROGRAM

Mr. **Yates**. What is the status of the mine land reclamation program that is being transferred to the Office of Surface Mining?

Mr. **Horton**. Yes, sir, it has been.

Mr. YATES. It has been transferred already. What has been transferred?

Mr. HORTON. The function and approximately 53 people.

Mr. YATES. How does that affect your 1983 budget request?

Mr. OYLER. Mr. Chairman, very little under direct appropriations because the abandoned land mine program was financed by monies from other agencies to a very large extent, the Appalachian Region Commission, the appropriations made to the Office of Surface Mining passed through to the Bureau of Mines and reimbursements in an earlier year from the Office of Surface Mining in the mines and minerals budget.

There are only two positions and $150,000 in direct appropriations that were affected and that will be transferred to the Office of Surface Mining.

## UNDERGROUND DISPOSAL OF MINE WASTES

Mr. YATES. What activities in the underground disposal of mine wastes are you currently operating?

Mr. HORTON. We initiated a contract in Colorado, the Roadside Mine. Unfortunately, the ownership of the mine changed and the cooperative enthusiasm of the company changed and we just recently canceled that contract. So we could get out as inexpensively as possible.

We are now looking for another cooperating mine. Unfortunately, it was an excellent mine and an excellent approach, but once they changed ownerships, their enthusiasm for cooperation changed.

Mr. YATES. How much of the 1983 request is for underground disposal of mine wastes?

Mr. HORTON. Mr. Meikle?

Mr. MEIKLE. The mine waste control activity in 1983 is planned at $2.7 million. Now there are coal and noncoal components of that, sir.

## SOLVENT EXTRACTION RESEARCH

Mr. YATES. What is the current level of your effort in solvent extraction?

Mr. MILLER. The present level is nothing at this time. In 1983 we propose an increase.

Mr. YATES. Is that the $820,000 increase?

Mr. MILLER. Not the total amount, sir. It is on the order of $325,000.

Mr. YATES. How do you reconcile that with your statement on page BM-37 of your justification where you say, "An $820,000 increase is proposed to enable a new initiative in basic research on solvent extraction technology?"

Mr. MILLER. That is only part of it, Mr. Chairman, the balance has to do with two other items; one of which is the expansion of current work and recovery of fluorite from submarginal resources. In addition to that, we are proposing doing work in an area that we feel has a great deal of promise; having to do with flotation with respect to sulfide minerals. That we are proposing to be on the order of $250,000.

Mr. **Yates**. That is what you propose to use in 1983?
Mr. **Miller**. Yes, sir.
Mr. **Yates**. What minerals are most adaptable to solvent extraction?
Mr. **Miller**. Well, to begin with we are talking about cobalt and nickel; these are the ones that we feel to be important with respect to the strategic and critical minerals. Vanadium is another one, sir.

### PROTOTYPE BOREHOLE ASSAYING PROBE

Mr. **Yates**. How much will it cost for the construction of a prototype for borehole assaying probes?
Mr. **Miller**. I am sorry?
Mr. **Yates**. You are doing research on boreholes assaying probes?
Mr. **Miller**. Yes, sir.
Mr. **Yates**. What will it cost for construction of a prototype?
Mr. **Miller**. We are talking about $575,000.
Mr. **Yates**. How long will it take to construct it?
Mr. **Miller**. Approximately 2 years, Mr. Chairman.
Mr. **Yates**. Is industry working with you on this?
Mr. **Miller**. No, sir. The United States Geological Survey is, however.
Mr. **Yates**. What do you hope to accomplish from this research?
Mr. **Meikle**. Borehole assay systems provide in our judgment a unique opportunity to assay or determine the worth, the value of in-place ores prior to the mining. It gives the mining engineer, the mine planner, an opportunity to take a look at the deposit in a closer fashion than he has now via the use of bore holes.
Mr. **Yates**. But in line with the Administration's philosophy, why shouldn't you leave this to industry to do?
Mr. **Horton**. It is part of the increased emphasis on strategic and critical minerals to look at the lower grade resources at a more rapid rate. If one has a down-hole probe, it is not necessary to core the holes.
Mr. **Miller**. This research also takes into account the higher risk factor, Mr. Chairman.

### SULFUR IN CONSTRUCTION MATERIALS

Mr. **Yates**. Have you made any evaluation of any other environmental problems resulting from use of sulfur in construction materials?
Mr. **Miller**. No. This is one thing that we intend to get into more so than we have already.
Mr. **Yates**. When?
Mr. **Miller**. This coming year.
Mr. **Yates**. In 1983, how much money are you using for this?
Mr. **Miller**. We are proposing $400,000.
Mr. **Yates**. Will that sum of money permit you to do it?
Mr. **Miller**. To begin with, yes, sir.
Mr. **Yates**. What will be the total cost of your research?
Mr. **Miller**. I believe we would probably not require more than $1 million in total.

ASBESTOS RESEARCH

Mr. YATES. What about the mining of asbestos; does that come within your jurisdiction?

Mr. HORTON. The health aspects are not within our jurisdiction; no. We have done some work on the health aspects mainly in the proper identification of the asbestos minerals and the classification of some of the minerals.

Mr. YATES. On the health aspect, is asbestos as unhealthy as some people say it is? That is kind of a wide open question. I have been requested by the Board of Education of the City of Chicago some time ago to try to get a Federal grant to eliminate asbestos in walls in the school rooms. I don't know whether this is within the purview of your health investigation or not.

Dr. HENRIE. Mr. Chairman, that of course is in the courts now, the question you ask. But I think most people believe that the asbestos fiber has to be just a certain length, within a certain size, so that it gets in to a cell within the body and vibrates within the cell. So there are lots of limitations in defining the bad aspects of asbestos.

Of course, it has to be free in the air so it can be ingested by the lungs or perhaps in the stomach. Federal agencies, as you know, have been saying this for 7 or 8 years. About 4 years ago we decided that it was necessary that we do a real good study of characterizing asbestos itself, in determining if a mineral is truly asbestos and which similar minerals that are not asbestos. We wrote a very fine report on that subject and distributed three or four times as many as originally planned. We hope the report will go a long way in bringing about the proper definition of this mineral.

Mr. YATES. Who should define that mineral? Shouldn't it be the Bureau of Mines?

Dr. HENRIE. The Bureau of Mines did define it, and that is the essence of the report. Now, I suppose that the new issue is; is asbestos the only material that causes these health problems or do other mineral fibers do the same thing? Here again, I suppose this is going to be left up to the courts to decide.

Mr. YATES. How did you come to the conclusion that asbestos fiber was harmful?

Dr. HENRIE. We didn't come to that conclusion.

Mr. YATES. Who came to that conclusion?

Dr. HENRIE. I think Mt. Sinai Hospital—I am trying to think of the fellow's name; Dr. Selikoff discovered that and brought it to the attention of everyone. I think it was about 12 to 14 years ago that it was finally brought to our attention.

Mr. YATES. Who is doing the research on whether other fibers will have the same destructive effects?

Dr. HENRIE. This is NIOSH's responsibility, as far as the health situation is concerned.

Mr. YATES. Not yours?

Dr. HENRIE. We assisted in helping them to identify and characterize minerals, and we also have helped them to determine how to properly sample.

## RESEARCH ON HEALTH HAZARDS IN MINING

Mr. **Yates**. Who found the relationship between the dust in mines and silicosis and the black lung disease? Was that the Bureau of Mines?

Dr. **Henrie**. You are talking about something long before my time, but I did help establish the standards after the 1969 health and safety law. We used data principally from England to establish the criteria for our standards.

Dr. **Morgan**. I might add, long ago the Bureau of Mines did more of this work in the health area before these other independent health agencies were created. In fact, interestingly, in World War II, the Director of the Bureau of Mines, Dr. R. R. Sayers, was a medical doctor who came to his position via the Public Health Service. He had worked very closely with the Bureau of Mines on just these questions, black lung, silicosis, carbon monoxide and so forth, and became a very eminent man not only in medicine and in health-related mining diseases, but in strategic materials when he headed the Bureau of Mines in World War II.

Mr. **Yates**. Are there any indications that mining of other metals presents the worker-related problems that coal mining does? We do know workers in the sand pits are subject to silicosis.

Dr. **Henrie**. In most of the hard rock mines, silicosis is a problem and has been a problem for several hundred years. They have known for a long time that silicosis is a problem in hard rock mining.

If you were to read the book, "De Re Metalica," which is 15th Century technology, you would discover the same problems in that as we have now. Long exposure to dampness, water, cold water, hot water, all of the other things that are hazards in the mines. Besides that, your sulfide minerals, especially, do have pockets of noxious gasses, poisonous gasses; so all in all, working underground is not the most healthy environment.

## OFFICE OF MINERAL POLICY AND RESEARCH ANALYSIS

Mr. **Yates**. Has the transfer of the Office of Mineral Policy and Research Analysis from the Assistant Secretary to the Bureau enhanced the Bureau's analytical capabilities?

Mr. **Horton**. Yes, Mr. Chairman.

Mr. **Yates**. To what extent and where is this office in the Bureau?

Mr. **Horton**. To whom does it report?

Mr. **Yates**. Yes.

Mr. **Horton**. To the Office of Mineral Data Analysis. It no longer exists as a separate office within the Bureau. It has been merged into the Bureau's reorganized structure.

Mr. **Yates**. Where in the Bureau's reorganized structure?

Mr. **Horton**. It is now under the Assistant Director of Mineral Data Analysis.

### STATUS OF PLATINUM STUDY

Mr. **Yates**. All right. Your studies of cobalt, chromium and manganese are completed right now, right, in the event of disruption? What is the status of the platinum study.

Dr. **Enzer**. The three studies you mentioned are completed, the platimum study will be completed in September or October. It turns out to be the most difficult one because less data have been collected on that mineral than on the other three.

Mr. **Yates**. What other minerals need to be studied, Dr. Enzer?

Dr. **Enzer**. In addition to the four you mentioned, we are also going to consider copper, nickel, aluminum and potash.

Mr. **Yates**. Do you have money in the budget to study them, in the 1983 budget?

Dr. **Enzer**. Yes.

### MINE MAP REPOSITORY

Mr. **Yates**. Okay. You have mine maps that you prepare. Is there any charge made for those maps?

Mr. **Paone**. No, Mr. Chairman. The requests for mine maps come primarily from States or local jurisdictions.

Mr. **Yates**. So there is no charge for that?

Mr. **Paone**. No.

Mr. **Yates**. Where are you consolidating the mine maps?

Mr. **Paone**. In our Pittsburgh office.

### MINERAL INSTITUTES

Mr. **Yates**. All right. Mineral institutes; let's talk about those. You don't want any money for those in fiscal 1983, right?

Mr. **Horton**. No.

Mr. **Yates**. Does that mean that they are closed or will remain open without support?

Mr. **Horton**. Most should remain open with other support.

Mr. **Yates**. You hope so. Will there be public or private support for them?

Mr. **Horton**. There has been non-Federal support for all of them.

Mr. **Yates**. And that will continue?

Mr. **Horton**. The States have been giving half of the support.

Mr. **Yates**. Now they will have to support it all?

Mr. **Horton**. Or acquire funds elsewhere.

Mr. **Yates**. How much of your research program is likely to go to colleges and universities in the next fiscal year?

Mr. **Oyler**. I would estimate $5 million, Mr. Chairman.

Mr. **Yates**. Under your lack of funds for the institutes, when will they run out of money? You don't know the answer to that, do you; it depends on whether the States can raise the money? When are we going to run out of Federal money?

Mr. **Horton**. Dr. Morgan can speak to that.

Dr. **Morgan**. For this year, fiscal 1982, the Congress made available $9.2 million for the Mineral Institutes. We are making available to each of the 31 institutes $150,000 base funding. Their money will be available for at least the year starting July 1 this year through June 30 of next year and it can be extended if unspent in that period of time.

In addition, we are at the present time, following the instructions of the Conference Committee to effect some consolidation of these institutes. We are soliciting proposals from the institutes to create a few high level centers of generic mineral technology. We are contemplating funding four or five of those at a level of about $1 million each with the remaining money from fiscal 1982. And this $1 million per generic center will be set up in such a way that it could last 2 or 3 years in order to carry over a considerable period of time. We will establish letters of credit and they will draw against these letters of credit.

Mr. **Yates**. To what extent have you emphasized strategic and critical minerals with the institutues?

Dr. **Morgan**. There is a highly important charge to them in the light of the present Administration's emphasis on them.

### OFFICE OF EQUAL EMPLOYMENT OPPORTUNITY

Mr. **Yates**. Let's turn to general administration. You are cutting back the Office of Equal Employment Opportunity by 14 positions and $522,000; why are you doing that?

Mr. **Oyler**. That is not entirely in the Office of Equal Employment Opportunity, sir. Their share of that is $136,000 and six staff years.

Mr. **Yates**. All right. Why are you cutting back there?

Mr. **Horton**. In comparison to the rest of the agencies within the Department of the Interior and the work within the Bureau, the 15 provided for 1983 are in my opinion adequate.

Mr. **Yates**. Wouldn't it be fair to take a reduction across the board?

Mr. **Horton**. No, sir. The others in there, are minimal for what is required.

### CONSTRUCTION OF FACILITIES—BRUCETON, PA.

Mr. **Yates**. Okay. Let's turn to your supplemental. You want $4,073,000 to fund construction at Bruceton. What alternatives to building a new facility have you looked at?

Mr. **Horton**. We have had none other than what we provided at Bruceton in the way of trailers.

Mr. **Yates**. Doesn't GSA have other buildings that might be available to you?

Mr. **Horton**. Not at Bruceton. John Murphy, the Research Director for Bruceton, is here and he can speak to some of the specifics.

Mr. **Murphy**. Mr. Chairman, we were recently apprised that we should consider some DOE space on the site. Since we were apprised that that may be available, we have looked at it in some detail, and the space that I have been advised that is possibly available is two pilot plants that DOE had constructed, one for Synthane and one for Synthoil. I would characterize these in two ways: one is a small office building that doesn't meet the space requirements of moving from Forbes Avenue. The majority and the rest of the space I would characterize as modern barns, large pre-engineered steel buildings. They have no windows in them, for example.

And we have done an analysis of modifying that space to suit essentially an office environment, providing access to it because of the substantially increased volume of people that would be going to it; problems of road paving, parking lots, so forth.

And we find in our estimate it would actually cost several hundred thousand dollars more to retrofit that space than it would to provide a facility for the intended purpose.

Mr. **Yates** What is the status of the negotiations with Carnegie University for fair market value on the Bruceton facility?

Mr. **Murphy**. Mr. Horton can address that.

Mr. **Yates**. Where are you in the negotiations?

Mr. **Horton**. We are hung up somewhat on a requirement of the statute that requires the Secretary of the Interior to set the fair market value at the time of sale. The time of sale, presuming we get the appropriation, would be say 3 years from now, which would require that the sale price not be established until 3 years from now.

Understandably, Carnegie-Mellon is reluctant to sign a contract to buy something without a firm price on it. So it involves attempting to set a price now.

Mr. **Yates**. You don't know then when you will be able to start construction on the facility, do you? I would imagine you wouldn't start until you had a contract, would you?

Mr. **Horton**. No.

Mr. **Yates**. How long would you expect the construction to last?

Mr. **Horton**. Approximately 2 years; 18 months to 2 years.

Mr. **Yates**. Who is going to be housed in the new facility?

Mr. **Horton**. The people now at Forbes Avenue.

Mr. **Yates**. How many are there?

Mr. **Murphy**. There are approximately 150 people at Forbes Avenue plus some additional people we have in portable trailers already at Bruceton.

Mr. **Yates**. Is there any laboratory space in the new building?

Mr. **Murphy**. No, sir. There are labs of a sort that support the eastern field operation centers in their map analysis activities and the like.

Mr. **Yates**. Have you awarded the contract for design yet?

Mr. **Murphy**. No, sir.

Mr. **Horton**. No. It should be very shortly.

### DRAINAGE OF ANTHRACITE MINES

Mr. **Yates**. Okay. Let's talk about the drainage of anthracite mines. Is the Commonwealth of Pennsylvania likely to provide the money it is supposed to provide?

Mr. **Oyler**. The Commonwealth of Pennsylvania has informed us that it has no objection to our proposal to the committee, to Congress, to use this $991,000 in unobligated balance.

Mr. **Yates**. Now, your justification on page 91 says there is a limited program. Does this mean there are no longer problems with the drainage from anthracite mines?

Mr. Oyler. It means in technical terms, Mr. Chairman, that the appropriation that was made for these programs back in 1955 would now be exhausted and of course it is being cared for in other ways which have developed since then.

### HELIUM FUND

Mr. Yates. Let's turn to the helium fund; what is the status of the litigation? Have these cases been settled?

Mr. Horton. Mr. Sonnek.

Mr. Sonnek. The four suits involving the conservation companies have been settled; one in court and the other three out of court.

Mr. Yates. How are you going to fund the settlements, which I understand are about $77.5 million?

Mr. Sonnek. Pardon?

Mr. Yates. I understand the settlement is about $77.5 million.

Mr. Sonnek. Totally, between the four, it is closer to $100 million.

Mr. Yates. Is it?

Mr. Sonnek. Yes.

Mr. Yates. How are you going to fund it?

Mr. Sonnek. It has been funded through the Department of Justice.

Mr. Yates. Where is the money going to come from, through what appropriation, the Department of Justice appropriation?

Mr. Sonnek. Yes.

Mr. Yates. What was the potential liability?

Mr. Sonnek. Roughly $460 million.

Mr. Yates. What is the status of the Northern Natural Gas versus Grounds case?

Mr. Sonnek. As I recall, the judge in the case has called for a pretrial hearing, I believe June 4th, something like that. What he wants to do is get this thing going again. He has called the attorneys in to find out just where the case is at and he will set a hearing date at that time.

Mr. Yates. What is the basis for your statement that the value of the helium fund inventories has increased from $765 million to $807 million?

Mr. Sonnek. That is the book value of the helium inventory in storage which keeps increasing each year.

Mr. Yates. Does it?

Mr. Sonnek. Yes. Well, there is an interest accruing on that debt and an annual operating cost that we have to add to the value of the helium.

Mr. Yates. Okay. Now you have a net loss projected under your sales program for 1982 and 1983. Are you taking any steps to eliminate the loss?

Mr. Sonnek. That is an accounting loss. When the helium was put in underground storage, that is, in the inventory, it became an asset. We have produced some of that helium to purification and thus it shows up as a loss. Our cash flow is positive.

Mr. Yates. How did the cost of Government-supplied helium compare to helium costs on the open market?

Mr. **Sonnek**. Well, we are still charging $35 a thousand cubic feet. I understand private industry recently did increase their prices from approximately $25 to $26 up to about $28.50. They are having some problems and actually several of the companies are talking about an additional surcharge to cover some of their operations.

Mr. **Yates**. What is the current status of the Tip Top field?

Mr. **Sonnek**. We are still watching the Tip Top field. Industry continues to drill wells there which we monitor. More data is needed before we come up with an option paper for making a decision.

Mr. **Yates**. How long are you going to take before you make a decision?

Mr. **Horton**. I think it would be our feeling that the longer we can wait to make that decision, the better off we will be in the sense that the companies would then have more data. We would thus have more data as to the extent of the fields and volume involved.

Mr. **Yates**. No guess as to when this is likely to take place?

Mr. **Sonnek**. Well, Northwest is talking about a plant in 1986. However, there is slippage. They have already slipped about a year and a half. Just in the last week or so we have heard of further slippage.

### REPORT ON RESEARCH FACILITIES

Mr. **Yates**. Let's talk about the smaller research facilities. Are you of the opinion that you can have an effective research program at these small research levels?

Mr. **Horton**. Yes, sir.

Mr. **Yates**. Would you be better off if you transferred some of the research to colleges with whom you have a working relationship?

Mr. **Horton**. No, I don't believe so, sir.

Mr. **Yates**. Let's talk about overhead costs. Your 1981 overhead costs presented in the report show that at Rolla, Missouri, the costs provided the committee were 39.2 percent. Yet, you show the overhead costs at 25.1 percent. How do you account for the difference?

Mr. **Oyler**. As a result of the committee's directive to undertake this study, Mr. Chairman, we found that part of it related to the method of computing overhead costs. As a result of engaging in the study, we have made some revisions in the concept of what is included in overhead.

Mr. **Yates**. Is there a uniform method of accounting for overhead costs?

Mr. **Oyler**. Sir, I would say it is more nearly uniform.

Mr. **Yates**. When was it most nearly uniform?

Mr. **Oyler**. I would not claim that it is not most nearly now, Mr. Chairman. There has to be some individual variation.

Mr. **Yates**. How far are you from saying it is perfect?

Mr. **Oyler**. Mr. Chairman, far be it from me to say that anything in this world is ever perfect.

Mr. **Yates**. All right. Instead of using the word perfect, how far are you from saying it is uniform?

Mr. OYLER. I think I would have to say at this point that it is an optimum point of uniformity, Mr. Chairman.

Mr. YATES. That means it is uniform, then.

Okay. Now with the reductions in this budget, won't some of your research centers shrink and have less of a critical mass to continue this research work?

Mr. HORTON. There will be an obvious loss in some personnel. The decrease will be spread across—we have ten research installations and four field offices—a total of 14 offices.

Mr. YATES. You are not going to consolidate any of them, are you?

Mr. HORTON. There are no plans at present to do that. We will be studying that on a continuing basis. And when one looks like we believe it is getting ineffective, we will certainly look hard at that.

## STAFFING REPLACEMENT SITUATION

Mr. YATES. Some of your people are nearing retirement. Are you bringing along replacements for them?

Mr. HORTON. No, sir.

Mr. YATES. These are some of those that you are counting on to attrite?

Mr. HORTON. The retirements?

Mr. YATES. Yes.

Mr. HORTON. Yes. The high average age within some of the areas of the Bureau is a concern.

Mr. YATES. Well, how successful are you in getting reasonably competent talent for new jobs? Of course, college graduates are taking whatever jobs are available now, be they with the Bureau of Mines or elsewhere.

Mr. HORTON. Not necessarily within the mineral industry, though that has only very recently changed. A year ago, starting salaries for mining engineers and geologists with bachelor's degrees were $25,000 to $30,000. This spring there are far fewer job offers. That is only a very recent event.

Mr. YATES. So there is no need to worry about competition between the Bureau and private sector, is there?

Mr. HORTON. Not at this instant.

Mr. YATES. You have enough college graduates coming along to fill both requirements?

Mr. HORTON. Yes. That has only recently turned around.

Mr. YATES. I know.

Mr. HORTON. The oil companies are hiring many of them.

Mr. YATES. When is all this going to turn around?

Mr. HORTON. I wish I knew.

Mr. YATES. Well, you have been following Mr. Stockman's admonition. Do you also follow Secretary Regan's hopes on this?

Mr. HORTON. And my own.

## CONDITION OF PHYSICAL PLANT

Mr. YATES. How would you characterize the overall condition of your physical plant? I think I will let you put that in the record.

[The information follows:]

### CHARACTERIZATION OF PHYSICAL PLANT

The Bureau's facilities are in good physical condition except for the Forbes Avenue property in Pittsburgh, Pennsylvania, which would need considerable rehabilitation, and some smaller ancillary facilities at Bruceton, Pennsylvania, which need to be replaced over the next several years. The Forbes Avenue property is planned to be replaced with a new facility at Bruceton, Pennsylvania financed by the proposed supplemental appropriation request for fiscal year 1982. Bureau facilities include 12 field locations and the Washington Headquarters. The field sites are located in the following cities: Albany, Oregon; Avondale, Maryland; Pittsburgh/Bruceton, Pennsylvania; Twin Cities, Minnesota; Tuscaloosa, Alabama; Rolla, Missouri; Denver, Colorado; Spokane, Washington; Boulder City, Nevada; Reno, Nevada; Salt Lake City, Utah and Juneau, Alaska. The Salt Lake City Center, which was dedicated in 1980, is the newest facility. At the older Bureau-owned locations the Bureau supports a maintenance program to upgrade facilities. The fiscal year 1983 budget includes approximately $1,400,000 for this purpose. For instance, at Bruceton there are requirements for the upgrading of steam lines and the electrical distribution system, and for the renovation of older research buildings. Energy savings resulting from improvements in the steam system should provide cost savings within a moderate time span. Also, at the Rolla Center, requisite action is being taken to improve the existing electrical system.

### MAINTENANCE OF FACILITIES

Mr. YATES. And the question on how well you maintain your facilities.

[The information follows:]

### MAINTENANCE OF BUREAU FACILITIES

The Bureau of Mines has a continuous program for updating, upgrading and renovating its facilities. Examples are as follows: Though the move from the campus of the University of Maryland was a forced move, the Bureau was able to relocate the facility to nearby Avondale, Maryland. The building at Avondale was renovated and made into a modern research center. This was accomplished in 1978. In Salt Lake City the old center on the campus of the University of Utah was replaced by a new facility that was completed in late 1980. The aging structures at 4800 Forbes Avenue in Pittsburgh, Pennsylvania, are scheduled to be sold. A new administration building is to be built at Bruceton, Pennsylvania, to consolidate the Bureau at one location. The Tuscaloosa facility was constructed in 1936 and has been in continuous use since that time. In 1974, upgrading and modernizing of the facility began. Of primary importance was a new electrical system that was required in order to meet fire safety specifications. Further upgrading involved the heating, ventilating and air conditioning system, an improved plumbing system and an extension of the floor area. At the Rolla facility new siding, doors and windows have been installed in buildings 3, 5, 6, and 7, and new roofs have been installed on buildings 6, and 7. In addition to upgrading the buildings, these actions support good energy conservation practices. The Rolla facility is being improved further by upgrading the electrical system. Each facility budgets a portion of its authorized funding to provide for normal operation and maintenance expenses.

### CLOSING REMARKS

Mr. YATES. All right. Do you have any special projects for which you want special funding?

Mr. HORTON. Not especially.

Mr. YATES. Okay.

Mr. HORTON. Though your generous offer is sincerely appreciated.

Mr. YATES. Well, I keep thinking the Bureau of Mines is such a good operation, I hate to see it deteriorate and I am afraid you are going to deteriorate as the funding gets less and less, you are going to lose better and better men and women from your staffs and I think that is unfortunate. I hate to see it happen.

Mr. Horton. If I might give you a few positives.

Mr. Yates. Well, I think you could use a few positives.

Mr. Horton. Having only been with the Bureau of Mines for 6 months, I find I still have much to learn. But I have been exceedingly pleased with some of the things I have found. Very briefly, I will comment on just two items.

You mentioned sulfur concrete. The Bureau has indeed established an entire new industry, sulfur concrete. There is now a firm in Texas that manufactures the sulfur compound with the plasticizers and additives that the Bureau has identified and there are firms springing up almost worldwide to supply sulfur concrete to those that need it. The industry started essentially at Boulder City, Nevada, in the Bureau of Mines.

Mr. Yates. I think that is fine.

Mr. Horton. A substantial success story.

Mr. Yates. I think that is fine. I think you are making a very good argument for further research by the Bureau of Mines. Now, do you want the budget to supplement that?

Mr. Horton. The sulfur we feel is well funded.

Mr. Yates. I see. So you are set in concrete. With that, we will end the hearing. We have a number of questions that we want you to answer for the record and we will provide those to you along with the questions from Mr. Murtha and Mr. McDade. Thank you very much.

[The information follows:]

## Questions Submitted by the Committee

### Health and Safety Research

Question: Have you noticed in the last year a willingness on the part of industry to increase its investment in health and safety research?

Answer: Yes we have noticed such a willingness. In FY 1982, industry cost share contracts are estimated $2,966 million or 39% of the total contract cost, and FY 1983, is estimated $1,400 million or 34% of the total contract cost. These cost sharing contracts have occurred despite a decreasing Bureau contract program in health and safety. In addition, nearly 20% of the active cooperative agreements in health and safety have been initiated since January, 1981.

Question: The President's program changes the focus on research to long-term projects. In the health and safety field, what has been the traditional mix between long-term and short-term research in the Bureau? How do you assess the ability of the Bureau's staff to make this transition to long-term research in the health and safety field?

Answer: The Bureau's Health and Safety program has progressed from developing compliance technology (short-term research) needed in the early 1970's for meeting regulations to one of investigating basic causes (long-term research) of health and safety problems. The short-term compliance research did serve a useful purpose by ensuring that the mining and minerals industry could continue to operate under the new regulations and by offering many "quick fix" solutions. These solutions did not always solve the basic health and safety problems, but lessened their impact. As the program matured, the need for more basic research into the root cause of the health and safety problems became evident. Once the cause of the problem is determined, solutions which are both cost effective and practical, can be derived. These types of solutions take longer to develop. As a result, the program has moved toward long-term and high-risk research seeking optimal solutions with a long-term payoff. However, this approach still allows the Bureau to respond to emergencies, such as the recent winter mine disasters, without sacrificing the base of expertise necessary for the long range problems of an expanding minerals industry.

Since early in the 1970's, most of the Bureau's long-term research has been carried out by the Bureau's in-house staff, which has gained substantial recognition in the research community for its accomplishments. The Bureau is confident, therefore, that a transition to more long-term research can be easily accommodated by its established in-house research staff.

Question: You indicate that there is strong cooperation with the mining industry on projects involving development and evaluation of control technology. Please list the projects you have underway in FY 1982, those planned for FY 1983, with the dollar amounts for each.

Answer: FY 1982 and FY 1983 Health and Safety control technology research that have strong cooperation are as follows:

| Project Area | FY 1982 ($000) Industry Cost | FY 1982 ($000) Gov't. Cost | FY 1983 ($000) Industry Cost | FY 1983 ($000) Gov't. Cost |
|---|---|---|---|---|
| Respirable Dust | 255 | 915 | 220 | 545 |
| Radiation Hazards | 110 | 170 | 0 | 0 |
| Noise Control | 315 | 710 | 65 | 280 |
| Industrial Hygiene | 210 | 465 | 80 | 250 |
| Ventilation | 40 | 400 | 0 | -- |
| Subtotal, Health | 930 | 2,660 | 365 | 1,075 |
| Fires and Explosions | 383 | 257 | 150 | 150 |
| Methane Control | 780 | 571 | 400 | 400 |
| Ground Control | 233 | 700 | 280 | 800 |
| Industrial Hazards | 500 | 200 | 15 | 50 |
| Post Disaster | 50 | 100 | 100 | 50 |
| Explosives | 0 | -- | 0 | -- |
| Systems Engineering | 90 | 192 | 90 | 192 |
| Subtotal, Safety | 2,036 | 2,020 | 1,035 | 1,642 |
| Total, Health and Safety | 2,966 | 4,680 | 1,400 | 2,717 |

Note: FY 1983 figures are estimates based on current information.
In several cases, costs shown are portions of contracts being performed over several years.

Cooperation by the mining industry is also realized when mine operators allow Bureau personnel or contractors access to operating mines to take measurements or to perform in mine tests of equipment that has been developed or modified. In FY 1982 approximately 80 mines cooperated in this manner in our health research program, including respirable dust. This cooperation is expected to continue in FY 1983.

Question: The respirable dust research will be reduced by about 15%. Provide for the record a list of the projects you plan for FY 1983.

Answer: The following is a list of projects in respirable dust research planned for FY 1983:

1. Reduction of Airborne Coal Dust and Mine Energy Consumption with Increased Machine Efficiency
2. Chemicals for More Effective Dust Control in Mines
3. Development of Improved Dust Control Technologies for Coal Mines
4. Respirable Dust Measurement and Instrumentation Evaluation
5. Characterization of Airborne Coal Dust and Determination of the Particle Size Distribution of Coal Dust and Silica Particles
6. Conveyor Belt Dust Control
7. Evaluation of Fundamental Approaches to Longwall Dust Control
8. Refinement and Evaluation of Basic Longwall Dust Control Techniques
9. Research on Water Proportioning for Dust Control on Longwalls
10. Dust Control at Longwalls with Water Infusion and Foam
11. Evaluation of Air Sprays and Unique Foam Application Methods for Longwall Dust Control
12. Improved Canopy Air Curtain
13. Near Face Infusion for Longwall Dust Control
14. Ventilation and Dust Control of Low Auger Mining Section
15. Evaluation of Two, Three, and Four Entry Longwall Panel Developments for Improved Dust Control and Face Ventilation
16. Guidelines for Selecting Sampling Location(s) on Longwall Shearer Faces
17. Dust Control Technologies for Metal and Nonmetal Mines and Processing Mills
18. Analysis of MSHA Health and Safety Inspection Data from Metal and Nonmetal Mines
19. Characterization of Airborne Noncoal Dust and Determination of the Size Distribution of Silica Particles in Respirable Noncoal Dust
20. Design, Development and Demonstration of the Use of Hollow and Wet Cutter Bars
21. Evaluation of Electric Charged Fiber Material for Dust Measurement in Mining/Milling Applications
22. Fundamental Analysis of the Mechanism by Which Dust Control is Achieved by the Addition of Moisture in the Form of Foam, Mist, Steam, and Humidity

Question: The radiation hazards research is being reduced by about 25%. Provide for the record a list of the projects you plan for FY 1983.

Answer: The following is a list of projects in radiation hazards research planned for FY 1983:

1. Radon Control Technology
2. Control of Radon Daughters Through Air Cleaning and Other Removal Techniques
3. Personal Exposure Instrumentation and Measurement Technology
4. Radiation Warning System for Uranium Mines

Question: The Bureau of Mines publication, "Research 81," describes a water-powered scrubber that is now commercially available. To what extent did the mining industry participate in the development of the water powered scrubber? How extensively is the water-powered scrubber being used? How was the Bureau's research transferred to private industry for commercialization?

Answer: Industry participation in the development of the water-powered scrubber was in the form of access to operating mines in which in-mine tests of the scrubber were performed.

The water powered scrubber has been available for approximately six months. Currently, three of the units are in operation in underground mines, and another 20 units are on order.

The Bureau's research on the water-powered scrubber was transferred to the mining industry through the use of two principal mechanisms:

(1) industry participation in underground mining evaluations; and
(2) Technology News articles mailed to 15,000 mine operators.

Question: When the Bureau works with industry on developing a particular research project, do you have agreements that allow the Government to receive a return on its investment?

Answer: The Bureau has regularly pursued cooperative and cost sharing arrangements on research projects with industry. Although these arrangements do not generally allow the Government to receive a return on its investment, they can reduce the Bureau's development cost substantially. In addition, when Bureau developed technology is implemented, the Nation can receive a return on its investment through a safer, healthier, and more productive mining industry. This return can be direct, such as reduction in black lung payments by the Government because of better dust control, and indirect, such as higher production due to more available production time from improved methane control techniques.

However, using a new approach in its attempt to be innovative and cost conscious, the Bureau in FY 1982 awarded a development contract for a piece of drilling equipment that not only provides for contractor cost sharing but also provides for the Government recouping all its development cost. The contract calls for the contractor to return to the Government, in the form of royalty payments, the Government's portion of the design and development costs. Industry response to this type of arrangement has been very favorable, and the Bureau intends to pursue this type of contracting in the future.

## Safety Hazards Reduction

Question: The budget describes the Bureau's efforts as divided between designing hazardous conditions out of the mine system, while concurrently addressing critical safety problems which exist in present mining operations. What is the division of resources in FY 1983 between designing hazardous conditions out of the mine system and addressing current problems? How does this division compare with the FY 1981 and FY 1982 efforts?

Answer: No precise division of resources exists between research directed at designing the hazardous conditions out of the mine system, versus research addressing critical safety problems. The Bureau's health and safety research program has developed to a point where the quick fix, retrofittable, compliance type of research is decreasing and the basic, fundamental research is increasing to the point where it is now the major thrust. The need for more basic research into the root cause of the health and safety problems has become apparent. This is consistent with the President's April 5, 1982 policy announcement that any government-financed Research & Development activities will concentrate on long term, high risk, high potential payoff projects with the best chance for wide generic application.

Question: The last three budget justifications have indicated that the Bureau is evaluating alternatives to rock dusting in coal mines. What are the alternatives you are evaluating? How much longer will you be evaluating these alternatives? Provide for the record the results of your evaluations of rock dusting alternatives from FY 1981 and what alternatives you are evaluating in FY 1983. When might we expect some results?

Answer: Three alternatives to rock dusting are being explored by the Bureau. These are salt encrustation, coal binding agents, and phosphate bearing ores and chemicals. These alternatives would provide a chemical mixing with coal dust for the prevention of mine explosions rather than layering as is presently the case with lime dust.

Bureau supported research in salt encrustation is expected to end in FY 1982. In-house work on coal binding agents will continue with tests being conducted as new candidate materials are identified. In-house work on phosphate bearing ores and chemicals will continue through FY 1985.

Field tests using a salt-based agent mixture in a U.S. coal mine indicated that salt induced corrosion was much more significant than suggested in previous lab tests; recent lab tests indicated that the nature of the wetting agent was critically important in determining the absorption of new coal dust by the mixture.

In view of the serious nature of salt induced corrosion on coal mining equipment, there are no plans for continuing the salt research past FY 1982. In-mine testing of a specific coal dust binding agent is scheduled for July 1982; past work has not uncovered any "unique ingredient." Recent laboratory and in-mine tests have shown that ammonium phosphate is vastly superior to rock dust in inhibiting coal dust explosions. Several phosphate bearing ores have been examined in an effort to find an inexpensive and more effective substitute for rock dust; they were more effective than rock dust but not to the degree necessary for enhanced safety and cost effectiveness. Intermediates between the raw phosphate ores and the finished product, ammonium phosphate, will be examined in FY 1983.

The final report in the salt-encrustration process is due in late FY 1982. It will contain recommendations related to the application of the technology for mine explosion protection. Recommendations on the effectiveness and economy of phosphate bearing ores and chemicals are expected in FY 1984 along with in-mine validation of laboratory results.

## Minerals Environmental Technology

Question: Mining activities often disturb ground and surface water flows. What programs do you now have in place to try to alleviate problems to ground and surface water flows caused by mining? What have you requested for this effort in FY 1983? What will this level of effort accomplish?

Answer: The Bureau of Mines hydrology research program is directed toward solving hydrologic problems related to underground, surface, and solution mining, primarily at specific mine sites. The Bureau takes advantage of related work in other agencies and in particular works closely with the Water Resources Division of the Geological Survey and also with the Office of Surface Mining to ensure the operation of a balanced hydrologic research program.

The FY 1983 research program to develop techniques to analyze or control the effect of mining on surface and groundwater systems is approximately $500,000. Some specific anticipated accomplishments will be the determination of the impact of mining on groundwater in the Arizona copper mining district; the development of computer models of mine dewatering in fracture dominated aquifer systems through research at the Sunshine Mine in West Virginia; and the development of low cost and more effective mine sealing methods through research at mine sites in Ohio, West Virginia, and Pennsylvania.

## Mineral Resources Technology

Question: The FY 1982 appropriation included a significant increase for mineral resources technology. How successful have you been in adjusting to the FY 1982 increase? To what extent are the FY 1982 increases dedicated to strategic or critical minerals?

Answer: The increase in the FY 1982 appropriation for mineral resources technology was effectively integrated into the ongoing program, and since the thrust of the enhanced effort was in complete consonance with research already underway, the adjustment consisted primarily of a reassignment of personnel already familiar with the technologies at issue. The result was a smooth transition with minimal perturbation.

Approximately 75 percent of the increase in the FY 1982 budget for mineral resources technology was dedicated specifically to critical and strategic materials. For example, almost 25 percent of the increase was allocated to efforts related to cobalt. Work on titanium and chromium also was significantly augmented, with the proportion of the increase programmed to these commodities being almost 17 percent and 8 percent, respectively.

Enhanced funding of work in close support of studies on critical and strategic minerals accounted for about 18 percent of the increase, and included intensified efforts in beneficiation, comminution, and fine particle processing. Although broad based, and not commodity specific, work in these areas has potential applicability to almost all commodities, including those critical to the national interest.

Question: What are the uses of fluorite that give it such a high priority?

Answer: The mineral fluorite ($CaF_2$), is the most important commercial source of fluorine, which, in elemental form, or combined with other elements, is essential in iron and steel production; for aluminum smelting; and for wide-ranging uses by the chemical industry. Presently, there are no satisfactory substitutes for fluorine chemicals in these uses, and since the U.S. is dependent on foreign sources for about 85 percent of its fluorine needs, investigation of processes applicable to the extensive, but low grade, domestic resources will help assure the availability of this essential material.

Question: In the conserving domestic resources program, what is the split between mining and processing technique improvements and recycling technique improvements?

Answer: The split is as follows: mining and processing technique improvements--$2,382,000; recycling technique improvements--$3,773,000.

Question: You propose to scale up from bench scale an electrolytic method for improving lead recovery from scrap batteries. How do you plan to scale up? Will it involve a pilot plant? What will it cost to achieve this scale up?

Answer: Construction and operation of the scaled up process research unit (PRU) on scrap batteries began early in FY 1982. The PRU-scale of research is sufficient for economic evaluation and a larger-scale pilot plant is not necessary. Operation of the scaled up equipment will continue through FY 1983. The bench scale equipment has a solution capacity of about 1 quart whereas the PRU has a capacity 20 times larger. This scale up was achieved at a cost of $25,000 per year for an additional 1/2 person year of effort plus $5,000 for the additional equipment.

## Minerals Information

Question: There is no change in the resource level for minerals information from FY 1982 to FY 1983. What gaps remain in the development of minerals information? How does your FY 1983 request address these gaps?

Answer: One aspect of the National Materials and Minerals Program Plan and Report to Congress includes an effort to improve the Federal Government's capability to collect and analyze information necessary to support the formulation of policies related to nonfuel minerals. The Interagency Minerals Information Coordinating Committee, chaired by the Bureau of Mines, is already actively exploring different means for improving the availability of data needed for implementation of this policy. Two working groups within the committee, both chaired by the Bureau of Mines, have been established; one to deal with problems related to minerals information data and one to deal with analytical systems. The Minerals Data Working Group has just published the Minerals Data Source Directory. Included are such sources as data bases, surveys, publications or information systems containing data pertaining to all aspects of domestic and foreign mineral production, consumption, trade, etc. in 21 Government agencies. This group is also working to recommend solutions to data gaps and compatibility problems among Government minerals data sources. The members of the Working Group developed a list of data gaps within their respective agencies. Subgroups were established to explore the data gaps that were of the greatest interest to the agencies. These subgroups developed additional background information on several of the gaps including known data sources, ongoing coordination activities in these areas, and made preliminary assessments of the gaps. The lead agencies and the gaps investigated are listed below:

| Potential Data Gap | Lead Agency |
|---|---|
| Digitized Inventory of Federal Lands | U.S. Geological Survey |
| Exploration Data | U.S. Geological Survey |
| Foreign Mineral Consumption | Central Intelligence Agency |
| Foreign Mineral Production | Central Intelligence Agency |
| Foreign Mineral Stocks | Bureau of Mines |
| Foreign Mineral Taxes | Bureau of Mines |
| Foreign Refining Capacity | Central Intelligence Agency |
| Foreign Reserves/Resources | U.S. Geological Survey |
| Foreign Trade | State Department |
| Impact of Regulatory Actions on Mineral Industries | Department of Commerce |
| Mineral Potential of Federal Lands | U.S. Geological Survey |
| Stockpiles-Public and Private | Federal Emergency Management Agency |
| Substitution | Department of Commerce |
| Transportation | Bureau of Mines |

The subgroup addressing transportation compiled a list detailing the major sources of domestic and international transportation data including both government and industry information sources. The subgroup concluded that transportation was not a data gap but rather a problem of identifying sources of available information.

Two subgroups are currently investigating exploration data and data relating to the impact of regulatory actions on the mineral industry. These subgroups are reviewing existing data sources, identifying compatibility problems and will prepare recommendation for resolution of these problems. Investigations of other data gaps including substitution, foreign mineral taxes and digitized inventory of Federal lands will be started following the completion of the recommendations of these two subgroups. Efforts will continue in FY 1983 to address all aspects of the coordinated inter-agency effort as a part of overall Mineral Information Systems development work.

Question: Do organizations like the American Mining Congress collect minerals data? If so, how is their data collection effort coordinated with yours?

Answer: The American Mining Congress does not regularly collect minerals data from its members. Other trade associations, such as the American Iron and Steel Institute and the Portland Cement Association do collect statistical data from their members. Where the Bureau finds that their collection is reliable and timely, it obtains the results of their collection, supplements them with its own collection from any producers who are not members, and publishes statistics covering the entire industry.

Question: What long range projections, if any, do you make? How often are they updated?

Answer: Every 5 years the Bureau publishes, "Mineral Facts and Problems," which includes for each mineral commodity a 20-year forecast of U.S. production, U.S. demand, and rest of world demand. The most recent edition is 1980. For key commodities these forecasts are updated at least once within the 5-year publication cycle. In 1983, forecasts for 20 commodities will be updated and published as "Mineral Commodity Profiles." Separate from these regular forecasts, the Bureau is developing econometric models to forecast world supply and demand for individual strategic minerals under alternative economic assumptions.

Question: Who are the users of the minerals information you collect and analyze?

Answer: Every organization that needs minerals data and information beyond what it generates internally is a user of Bureau of Mines information and analysis. This would include, besides the Bureau of Mines itself, other agencies of the U.S. Government, U.S. mineral companies, agencies of foreign governments, intergovernmental commodity organizations, foreign mineral companies, financial institutions, mining and economic consultants, university researchers, and the news media. Evidence that these organizations are using the Bureau's data is based on written and personal inquiries that are received requesting data not yet published or additional details of the data or of the analyses that are not in the publications. The Bureau has also held a series of user conferences with participants representing a wide variety of the users of Bureau data. These user conferences have indicated that Bureau data is put to various uses such as to provide historical background and trends information for long range planning at company and project levels or for reference. Government agencies use Bureau data to assess the impact of existing or proposed policies. Mineral producers use the data to study whether they are holding their share in various markets. Financial institutions use Bureau data to examine the growth potential and capacity utilization of mineral sectors seeking additional capital.

Question: Can the public access your automated systems?

Answer: Much of the data contained in automated systems is detailed company proprietary information. To protect this proprietary information from disclosure, direct access to these systems has not been provided. Aggregated data which do not disclose proprietary information is routinely made available to the public through Bureau publications such as the Mineral Industry Surveys and the Minerals Yearbook.

Question: Who are the Federal policymakers who use your information?

Answer: Bureau of Mines' minerals information is used by many Federal agencies. Minerals information impacts on a number of policy areas, e.g. defense, trade, foreign relations and, of course, mineral policy itself. Policymakers within the Department of the Interior concerned with mineral policy are users of the Bureau's information and analysis. Outside of the Department, users include Congressional committees, Federal Emergency Management Agency officials concerned with strategic stockpile policy, Office of the Special Representative for Trade Negotiations officials concerned with trade policy, Department of Defense officials concerned with security of mineral supply for weapons production, the Environmental Protection Agency concerned with formulating environmental regulations, Department of Energy concerned with efficient energy use, Department of Agriculture concerned with fertilizers and nutrients, and Department of State officials concerned with treatment of U.S. enterprises in foreign countries, as well as the White House Office of Policy Development and the National Security Council. Policymakers, throughout the Federal Government, face the same analytical problems and the need for data to address these problems. Data are used to measure the extent of the undesirable effects that new policies seek to remedy. Data are used to support the contentions as to the cause of the undesirable effects. Data are used as the basis of the forecasts required to estimate the impacts of the proposed policies.

Question: P. L. 96-479, the National Materials and Minerals Policy, Research and Development Act calls for improving the capacity of the Bureau of Mines to assess international minerals supplies. How have you responded to this requirement?

Answer: On March 31 of this year, the number of personnel assigned to the Branch of Foreign Data was increased by about one-third. This was accomplished by internal transfers within the Bureau. At the same time, the organization was upgraded from a Branch to a Division. With these additional personnel, the Administration's commitment relative to Foreign Minerals Data and Analysis as stated in the "National Materials and Minerals Program Plan and Report to Congress," will be carried out. For example, the additional personnel will enable the Bureau to conduct a number of in-depth analytical studies dealing with mineral supplies strategic and critical to the United States and its allies as well as to the nations of the Soviet Bloc. Specific countries to be examined include, Zimbabwe, Australia, the Soviet Union, and Namibia. Visits to mineral industry facilities (mines, processing plants, smelters, etc.) and counterpart agencies in foreign countries will be increased. This will provide the Bureau of Mines with firsthand information and an opportunity to establish contacts and expand the information base on mineral supply. Closer cooperation will be sought with Foreign Service posts of the Department of State in order to assure, and enhance, receipt of data on foreign mineral production and trade. Through personal contacts (letters, telephone and meetings) with representatives of both domestic and foreign companies, the Bureau will have more ready access to international data and be better prepared to evaluate and dispense such information. Also, the additional staff will permit the Bureau to update and improve the Mineral Perspective series.

## Analysis of Potential Critical Mineral Problems

Question: A Departmental priority in FY 1983 is an improved capability to analyze and respond to potential critical mineral problems. How does the budget reflect this Department priority?

Answer: The Bureau of Mines FY 1983 budget request provides for various programs in this area which have significant applications in the identification, analysis, and response to potential critical mineral problems.

The proposed budget includes funds for the Minerals Availability System (MAS) studies. MAS develops and maintains worldwide minerals availability information and analysis for input into a variety of analyses supporting Federal decisionmaking. Of particular importance in spotting critical mineral problems, MAS studies are used to project production, costs, and the ability to expand production of critical minerals if a crisis should arise. MAS can also be used to spot long-term problems, particularly for those critical minerals which may only be available at a significantly higher price. MAS also forecasts how fast known reserves are declining, an important factor in determining the availability of critical minerals.

The FY 1983 budget also includes funds for a variety of studies which directly and indirectly enhance the Bureau of Mines capability to deal with critical mineral problems. In addition to completing a critical mineral index for cobalt, chromium, manganese, and platinum-group metals, the Bureau will initiate work on:

- development of a set of procedures--also known as a critical minerals protocol--for dealing with critical minerals problems that actually occur. Closer government-industry cooperation--in terms of providing accurate information on basic needs, inventories, production, the extent of bottlenecks or disruptions, and ways of dealing with it--can reduce the effects of critical minerals problems.

- development of methods for integrating MAS with demand models in order to improve forecasting and to test the impact of government policies in terms of how well they solve potential or actual minerals problems.

- development of analytic methods to use land assessment data for the identification of critical mineral deposits on Federal and Indian lands and for then using MAS to evaluate the production potential of such deposits.

- analysis of the domestic regulatory impact on such metals as lead and zinc, which could, if a severe supply crisis occurred, be in very short supply.

With a combination of improved supply analysis and appropriate demand analysis, the Bureau will be better able to identify, analyze, and deal with critical minerals problems.

## Contributed Funds

Question: Provide the sources of the contributed funds for FY 1981 and what you expect the sources to be in FY 1982 and FY 1983.

Answer: The Contributors to this fund in FY 1981 by subactivity were as follows:

Minerals Health and Safety Technology
  Contributor: Homestake Mining

Mineral Resources Technology
  Contributors: Aluminum Company of America
  Aluminum Company of Canada
  Amax Lead and Zinc, Inc.
  Asarco Incorporated
  Billiton International Metals
  British Steel Corporation
  Brown and Root, Inc.
  Cominco, Ltd
  Korea Research Institute of Geoscience and Mineral Resources
  Lehigh University
  Nord Resources Corporation
  Reynolds Metals Company
  St. Joe Minerals Corporation
  Tilene, Inc.

Data Collection and Analysis
  Contributors: Commonwealth of Puerto Rico
  Phelps Dodge Corporation

The FY 1982 contributors to the fund through April, 1982 have been:

Minerals Health and Safety Technology
  Contributor: McDermott Mine

Minerals Environmental Technology
  Contributor: Amax Coal

Mineral Resources Technology
  Contributors: Amax Lead and Zinc, Inc.
  Asarco Inc.
  Cominco, Ltd
  Lehigh University
  St. Joe Minerals Corporation

For FY 1983, the Bureau anticipates approximately $800,000 to be contributed from outside sources.

## Administrative Provisions

Question: The appropriation for the Bureau of Mines each year contains an administrative provision which authorizes the Bureau to sell directly any metal or mineral product that may be manufactured in pilot plants operated by the Bureau. What receipts did you realize in FY 1981? What receipts do you anticipate in FY 1982 and FY 1983?

Answer: The actual receipts for FY 1981 and those estimated for FY 1982 and FY 1983 are $1,000 each year.

Question: Provide for the record a list of the pilot plants you plan to operate in FY 1982 and FY 1983 with a brief description of each.

Answer: In FY 1982 and FY 1983 the Bureau does not plan to operate any pilot plants. However, in FY 1982 we will continue to conduct research on a scale large enough to generate data from which pilot plants could be designed. These include the Bureau's alumina miniplant operation at our Boulder City (Nevada) Engineering Laboratory where we are investigating hydrochloric acid leaching of clay to form alumina, an intermediate compound used to produce aluminum. This work is being conducted in cooperation with five firms: Alcan International, Ltd.; Anaconda Aluminum Co.; Billiton International Metals; Kaiser Aluminum and Chemical Corp.; and Reynolds Metals Co.

We are also investigating a leach-electrolysis method for recovering lead from galena concentrates in a process development unit at our Reno (Nevada Research Center. This research is being conducted with four industrial cooperators: Amax Lead and Zinc, Inc.; Asarco Inc.; Cominco, Ltd.; and St. Joe Minerals Corp.

Additionally, in FY 1983 the Bureau will continue to cooperate with the Department of Energy in a large-scale effort to determine the technical feasibility of using low-Btu gas generated from the gasification of low-rank coals and fuels to indurate iron oxide pellets in a grate-kiln system.

## Personnel

Question: The budget for the Bureau reflects a total drop in employment of more than 200 people. Will you take the reductions in the Headquarters or in the field? Provide for the record the staff decreases at each of the field facilities and for Headquarters. When will these employees be terminated? Will you be able to handle the reduction through attrition or will you have to institute a reduction in force?

Answer: Personnel reductions will be taken in Headquarters and in the field. The reduction is planned to be accomplished through attrition during the remainder of FY 1982 and in FY 1983. No reduction in force should be necessary to achieve the proposed 10.8% reduction in personnel between FY 1982 and FY 1983. Attrition rates are expected to vary at each Bureau location from the overall Bureau average, based upon such factors as the relative age of the work force at particular centers, and thus actual staff decreases at a specific field facility or at Headquarters may differ from the 10.8% average. We are not able to predict, therefore, staff attrition at individual locations with enough accuracy to provide numbers of personnel to be reduced at each Bureau location.

## Consulting Services

Question: You have identified a need of $1,705,000 for consulting services in FY 1983. How does this compare to your experience in FY 1981 and FY 1982?

Answer: The sum of $1,705,000 for FY 1983 includes not only consulting services per se, but also chemical analyses, economic studies, ADP systems analyses, data analyses, mathematical and statistical analyses, and regulatory studies. Consulting services are projected to account for less than 7 percent of the total funding ($115,000). The largest component, chemical analyses of mineral samples collected in the field, accounts for approximately 82 percent ($1,400,000) of the total funding.

In FY 1981, the Bureau obligated $1,212,812 for these types of services. For the first 6 months of FY 1982, $373,888 has been obligated for similar services.

## Report on Research Facilities

Question: Please provide for the record, the items that the research centers now include as overhead.

Answer: The following items are research center overhead expenses: salaries and benefits for personnel assigned to the offices of the research directors; administrative services such as personnel, procurement, property management, mail services, and printing; safety management and equal employment opportunity programs and related activities; maintenance of buildings and grounds; utilities; general library services; security services; and general purpose/commonly used equipment (e.g. copy machines, work processors, etc.)

Question: With the proposed reductions in FY 1983, won't some of the research centers shrink further in size and thus have less of a critical mass to continue this research work?

Answer: All research centers will share, to some degree, reductions in personnel support. Headquarters and other field operations centers also will take a portion of these reductions in FY 1983. While overall personnel numbers in FY 1983 will be less than in FY 1982, there are no present plans to consolidate any of the centers. However, we will be monitoring the situation on a continuing basis.

## Personnel Replacement

Question: The study shows that the Bureau has a significant number of employees who are at retirement age. What are you doing to bring along replacements for those who are nearing retirement age?

Answer: Traditionally, the Bureau has employed qualified persons, where possible, at the entry levels. These employees were then developed through internal programs and processes, and selected through merit procedures to fill vacancies created by retiring employees. However, we have been handicapped in this effort because of two factors. Since 1971, the Bureau has been constrained by reduced personnel ceilings and various employment freezes. Since 1973, we have been at a disadvantage in our competition with industry for young professionals qualified in the scientific and engineering disciplines needed by the Bureau. Recently, however, our competitive position with respect to the private sector has been improving because of decreased demand for manpower in industry.

Question: How competitive is the Bureau with the private sector for college graduates?

Answer: The Bureau's competition with the private sector for college graduates represents a dichotomy. We have been in an advantageous position with respect to presenting opportunity for personal and technical growth, work environment, geographical location and job challenge. On the other hand, we have been extremely disadvantaged because of the great disparity between our maximum entry-level salary and that offered by the private sector. This has been particularly true relative to our efforts to hire the engineering and physical science graduates with the specialized disciplines required by the Bureau.

However, the recent situation in the private sector has resulted in a much lower demand for the types of personnel we require. Consequently, graduates are now acting more favorably to possible employment with the Bureau than at any other time within the past 10 years.

## Maintenance and Condition of Physical Facilities

Question: A number of facilities have buildings with significant age. What program do you have in place to keep your facilities well maintained?

Answer: The Bureau of Mines has a continuous program for updating, upgrading and renovating its facilities. Examples are as follows: Though the move from the campus of the University of Maryland was a forced move, the Bureau was able to relocate the facility to nearby Avondale, Maryland. The building at Avondale was renovated and made into a modern research center. This was accomplished in ]978. In Salt Lake City the old center on the campus of the University of Utah was replaced by a new facility that was completed in late ]980. The aging structures at 4800 Forbes Avenue in Pittsburgh, Pennsylvania, are scheduled to be sold. A new administration building is to be built at Bruceton, Pennsylvania, to consolidate the Bureau at one location. The Tuscaloosa facility was constructed in 1936 and has been in continuous use since that time. In 1974, upgrading and modernizing of the facility began. Of primary importance was a new electrical system that was required in order to meet fire safety specifications. Further upgrading involved the heating, ventilating and air conditioning system, an improved plumbing system and an extension of the floor area. At the Rolla facility new siding, doors and windows have been installed in buildings 3, 5, 6, and 7, and new roofs have been installed on buildings 6 and 7. In addition to upgrading the buildings, these actions support good energy conservation practices. The Rolla facility is being improved further by upgrading the electrical system. Each facility budgets a portion of its authorized funding to provide for normal operation and maintenance expenses.

Question: How would you characterize the overall condition of your physical plant?

Answer: The Bureau's facilities are in good physical condition except for the Forbes Avenue property in Pittsburgh, Pennsylvania, which would need considerable rehabilitation, and some smaller ancillary facilities at Bruceton, Pennsylvania, which need to be replaced over the next several years. The Forbes Avenue property is planned to be replaced with a new facility at Bruceton, Pennsylvania financed by the proposed supplemental appropriation request for FY 1982. Bureau facilities include 12 field locations and the Washington Headquarters. The field sites are located in the following cities: Albany, Oregon; Avondale, Maryland; Pittsburgh/Bruceton, Pennsylvania; Twin Cities, Minnesota; Tuscaloosa, Alabama; Rolla, Missouri; Denver, Colorado; Spokane, Washington; Boulder City, Nevada; Reno, Nevada; Salt Lake City, Utah and Juneau, Alaska. The Salt Lake City Center, which was dedicated in 1980, is the newest facility. At the older Bureau-owned locations the Bureau supports a maintenance program to upgrade facilities. The FY 1983 budget includes approximately $1,400,000 for this purpose. For instance, at Bruceton there are requirements for the upgrading of steam lines and the electrical distribution system, and for the renovation of older research buildings. Energy savings resulting from improvements in the steam system should provide cost savings within a moderate time span. Also, at the Rolla Center, requisite action is being taken to improve the existing electrical system.

## Mineral Research Support to Universities

Question: Provide for the record how much mineral related research support OSM, the Department of Energy, and EPA will provide to colleges and universities.

Answer: The FY 1983 budget request of the Office of Surface Mining provides $1.5 million for Technical Studies and Applied Research. Of the FY 1983 Department of Energy research budget, we construe $18.8 million to be mineral related. The FY 1983 research budget of Environmental Protection Agency related to minerals is essentially zero. The fraction of these budgets which will be provided to colleges and universities will depend upon program needs.

## Administrative Operations

Question: Two programs in Administrative Operations, finance and automatic data processing, lose staff but maintain level funding. Why is there no corresponding dollar decrease in those programs? Is there an increase in contractual support?

Answer: The reduction in the level of in-house staff in the Division of ADP reflects the planned contracting out of a major portion of computer and peripheral equipment operations and production control.

Contracting for computer operations and related functions will increase in FY 1983, as will the overall level of contractual support due to full-year presence of contractors in FY 1983 as compared with only 6 months in FY 1982. Normal increases in contracting and other costs also act to maintain the funding requirements at FY 1982 levels notwithstanding the decrease of in-house personnel.

In FY 1983, the Division of Finance will eliminate six positions in its Data Input Unit, the function of which is to enter data into the mini-computer via remote terminals. Contractor personnel will be utilized to handle any data input workload exceeding the capacity of in-house resources. In FY 1983, the combination of increases attributable to contractor costs, and residual costs of implementation of the new automated finance system (FAMIS-II) will preclude any budget decrease.

## Employee Workplace Health and Safety

Question: Safety management is being reduced by $250,000. Why are employee workplace health and safety projects being reduced?

Answer: Although the workplace health and safety funding, which is special money set aside for abatement of hazardous safety or health conditions in Bureau of Mines facilities has been eliminated, projects in this area will not be adversely affected. Through the years, many hazardous field conditions have been eliminated, and the need for this special funding is no longer urgent. Abatement of existing conditions can be funded through normal maintenance allocations.

Question: What incentive will managers have to use their research funds for employee health and safety projects if there is no central fund?

Answer: The absence of a central fund is not viewed as a disincentive, since a required maintenance program is in place at each research center. The primary incentive for reasonable expenditures to maintain an effective health and safety program is the managers basic concern for his employees' well-being. Additionally, the Occupational Safety and Health Act (OSHA) requires an employer to provide a workplace for its employees free from recognized hazards. Also, 29 CFR 1960, and E.O. 12196, entitled Basic Program Elements for Federal Employee Occupational Safety and Health Programs, and Occupational Safety and Health Programs for Federal Employees respectively provide further incentive.

Question: To what extent have health and safety projects been funded out of research funds in previous years?

Answer: In previous years, virtually 100 percent of the health and safety projects were funded by the research programs. Funds that made up the workplace health and safety central pool came from the research programs. In addition to the $250,000 central fund, approximately $500,000 per year in research funds was expended for workplace health and safety projects in Bureau facilities.

## Pittsburgh/Bruceton Administrative Services

Question: Pittsburgh/Bruceton administrative services are funded from administrative operations. How are the administrative services of the other research centers provided?

Answer: Administrative services for the other research centers are funded from the research programs. The Pittsburgh/Bruceton Research Center (P/BRC) funds its administrative services by providing research program funds to the supporting administrative organizations as reimbursement for services received. The administrative organizations at Pittsburgh/Bruceton support not only the Bureau of Mines, but also the Mining Safety and Health Administration (MSHA) and the Department of Energy (DOE). The Bureau administrative organizations support MSHA and DOE through interagency reimbursable agreements. In order to ensure an equitable distribution of costs, the funding arrangement for P/BRC is the same as for the other agencies supported.

## Personnel Compensation and Benefits

Question: Why are your personnel benefits increasing in FY 1983 when personnel compensation is decreasing?

Answer: The amount proposed for personnel benefits is a net increase of $266,000 over FY 1982. This results from a $927,000 increase in FY 1983 to reimburse the Employees' Compensation Fund for FY 1980 charges pursuant to P.L. 86-767. Personnel benefits have been reduced $661,000 in proportion to compensation.

## Questions Submitted by Congressman Murtha

## Health and Safety Technology

Question: Mr. Director, I realize we face a very tight budget year. But are we placing Mr. Reagan's problems on the backs of miners, jeopardizing their health and safety to try to balance a budget? I think perhaps we are. Only because we screamed loud and hard did the Administration scramble and restore $17 million to MSHA for mine inspection programs in fiscal year 1982 and 1983. Is the Administration being as short sighted in mine health and safety research as it has been in mine health and safety enforcement? Are we trying to balance a budget with a $100 billion deficit on the backs of those engaged in the most dangerous occupational category in this country? Is this compassion, caring, or even good common sense?

Answer: While this Administration continues to have every intention of fulfilling its statutory responsibilities regarding America's miners, the minerals industry has a direct and vital interest in the health and safety of its employees. Therefore, the Bureau's Health and Safety Program for FY 1983 will be focused on long-term, high-risk research for which the industry has little economic incentive or ability to perform seeking long-term pay off to critical health and safety problems of the mining and minerals industry. At the same time, the Bureau will increase its efforts to encourage industry to take a larger role in research--a role commensurate with its economic and statutory interests. Industry is expected to assume more mine-specific compliance-related research as well as demonstration of Bureau developed solutions. This is industry's proper role and will significantly reduce short-term research carried out by the Bureau. While the reduction in research costs will contribute to America's economic revitalization by reducing Federal spending, the rationale for that reduction is a recognition that industry--not the Bureau--has the responsibility for mine-specific compliance related health and safety research.

Question: The authorized funding limit for health and safety research is $60 million. Is it correct that your budget request is some $22 million short of the $60 million amount Congress authorized you to spend? Why then are you requesting a budget for health and safety research which is a $9.5 million cut from last year's already low amount?

Answer: The 1982 appropriation for Minerals Health and Safety Technology was $55,056,000. Using the new budget structure of the Bureau, in which General Administration is now shown as a line item, as requested by the Congress, the comparable FY 1982 appropriation is $46,014,000, compared to a FY 1983 request of $37,823,000, for a net decrease of $8,191,000.

Industry is expected to assume more mine-specific, compliance-related research and demonstration of Bureau developed solutions. This should substantially reduce the cost of carrying out research by the Bureau because of reduced labor, equipment, and demonstration costs. The experiences with cost sharing of Bureau projects by the industry leads the Bureau to conclude that the industry could and will assume a greater role. In addition, the Bureau has concluded that recent legislation will foster greater industry research. Specifically, the patent policy change allows small businesses and universities to receive exclusive licenses for Government patents. Additionally, the new tax credit for research and development expenses should encourage industry research. The reduction in Government research costs will contribute to America's economic recovery by reducing Federal spending while at the same time ensuring the existence of a sound health and safety program.

Question: How much is the Federal Government paying in Black Lung benefits each year to those inflicted with this crippling disease?

Answer: In FY 1981, $1.7 billion dollars were paid in Black Lung benefits.

Question: How much are you proposing in this budget for respirable dust research to find solutions to get to the root of this problem?

Answer: In FY 1983, $4,129,000 is planned for research aimed at the control of respirable dust. Over the past 10 years, the Bureau has invested approximately $35 million in respirable dust research activities, an average of $3.5 million a year.

Question: What progress are you making in respirable dust control?

Answer: The Bureau's respirable dust program has made significant progress in providing new and improved technology for respirable dust control and for reducing the dust levels in mines. Advances in dust control technology resulting from Bureau research and industry application of this technology and other procedures have allowed 95 percent of continuous miner sections to comply with and stay in compliance with the 2mg per cubic meter Federal dust standards at any given time.

Over the past several years, the focus has shifted toward solving the longwall dust problem, which is the major obstacle to achieving the full production potential of this growing mining method. A recent novel water spray development called the "shearer-clearer" has been widely applied to reduce the face worker's dust exposure. The "shearer-clearer" system and variations of this design are being used at 24 longwall operations resulting in the reduction in the overall dust levels. Application of this novel system and other techniques have contributed to reducing the average dust levels on all double drum shearer sections by 15 percent. Furthermore, as a result of direct Bureau involvement with longwall operators, 10 percent of all double-drum shearer faces have been brought into compliance with the Federal dust standards over the past year.

Although significant progress has been made to date, longwall operators continue to have difficulty in complying with the dust standards. In addition, there are a growing number of continuous miner sections under a reduced standard because of excessive levels of silica. Dust problems at some mineral processing operations, e.g. silica flour mills, continue to persist. In response to this problem, the Bureau continues to pursue cost effective dust control solutions that will reduce the dust levels in mines and minerals processing operations in an effort to reduce the incidence of respiratory diseases, the ultimate goal of the Bureau's respirable dust program.

Question: What types of projects would you have funded if you did not cut $9.5 million from this year's request?

Answer: The types of projects that would have been funded are in the areas of respirable dust, radiation hazards, noise control, industrial hygiene, ventilation, fire and explosion prevention, methane control, ground control, industrial hazards, explosives, and systems engineering.

Question: Your budget shows a reduction of 157 people in your health and safety program and 276 throughout the Bureau. Once you let these people go, is there any real prospect that you'd ever be able to get them back? What impact will this have on your research and development program?

Answer: The budget request for the Health and Safety Research Program proposes some significant funding reductions which impact the number of personnel required to carry the program out. As the contract program continues to be reduced, the number of technical project monitors who review contract work and others who support the contract effort can be reduced. In addition, industry is expected to assume more mine-specific compliance-related research and demonstration of Bureau developed solutions. This reduces the number of Bureau personnel required to monitor the demonstrations and to provide support to the industry.

Question: Is there any reason this Committee should not take prompt action and provide, at a bare minimum, the same funding and staffing we provided last year?

Answer: The $37.8 million recommended for health and safety research provides sufficient funds for the long-term, high-risk health and safety research activities which clearly are a Federal responsibility. Industry will allocate its own resources for the mine-specific, compliance-related types of health and safety research since such research contributes directly and significantly to their successful operations.

## Questions Submitted by Congressman McDade

## Subsidence Research

Question: Does the Bureau consider subsidence caused by abandoned mines a serious problem? What areas are hardest hit by such subsidence? Are urban or heavily used areas among those areas that are hard hit? Does the Bureau have a program in the subsidence area?

Answer: Particularly because caving can occur years after mining has ceased, subsidence over abandoned mines can be a serious problem. In longwall mining and in room-and-pillar mining with pillar extraction, caving of the roof is induced simultaneously with mining. In partial extraction room-and-pillar mining, caving usually occurs years after mining has ceased, and in most cases of mine roof caving, surface subsidence occurs. The fact that mining does cause subsidence has been clearly illustrated by the history of the anthracite region of northeastern Pennsylvania; the bituminous coal mining areas in western Pennsylvania, West Virginia, southern Illinois, and Indiana; and in coal and metal mining areas of numerous other states. The only work the Bureau currently is doing which is related to this subject is monitoring certain data concerning approproximately twenty active mines.

Question: Are there any proven methods of predicting subsidence caused by abandoned mines in a timely fashion so that mitigating steps can be taken to avoid both personal and property damage? (I mean methods that really work, not general predictions that subsidence will some day occur.) Does the Bureau have any active programs in this area? Isn't most recent subsidence work related to active mines, particularly long-wall mining?

Answer: There are no proven methods for subsidence prediction from abandoned (or active) mines. The Bureau has no such research program for either abandoned mines or active mines. The Bureau has a current program for recording and analyzing data at some 20 longwall and room-and-pillar sections in active coal mines. Based on these data there is some ability to predict the resulting maximum subsidence profiles for those mines, but even for those 20 mines there is no ability to establish the occurrence in a timely fashion nor even in a resonably definitive time frame.

Longwall mining is viewed as a safer and more productive means of mining than room-and-pillar techniques and it results in higher extraction ratios. It is also better suited to the deep deposits that will be mined in the future. For these reasons the Bureau monitoring program is primarily directed toward active longwall mining. We feel the emphasis ought to be on regulation of the use of the surface above or near abandoned as well as active mines instead of predicting future subsidence so that the risks of personal or property damage due to subsidence are avoided completely. Trying to develop a reliable capability to predict future subsidence following room-and-pillar mining would take extremely large commitments of budget resources over many years without any prospect of success. It is our belief that such funds could be applied to more productive purposes. Even if such a reliable predictive capability could be developed, it only would be meaningful if the predictive skills were sufficient to ensure that State and local governments as well as individuals would act on the basis of such predictions.

Question: Does instrumentation to measure ground movement related to subsidence exist? Wouldn't it make sense to try to assemble a comprehensive system to measure and predict subsidence related to abandoned mines? Isn't that the kind of thing for which we are spending millions of dollars each year in programs in the Geological Survey with regard to earthquakes, landslides and volcanos? Isn't the main thrust of the Geological Survey systems not the development of the instruments per se but the analysis and diagnosis of the data from the instruments by use of sophisticated computer-assisted techniques? Isn't it true that developing such a system might be difficult? Expensive? Require extensive experimentation and testing? Wouldn't the development of such a system through a research project be a natural role for the Bureau if funds for such a project were available.

Answer: Much of the Bureau of Mines instrumentation developed for ground control is useful in monitoring the subsurface part of subsidence. The Bureau is using these and other systems in its ongoing subsidence monitoring of active mines. Existing instrumentation is used for monitoring surface subsidence including theodolites, precise levels, and precise tiltmeters. Trying to develop a comprehensive system would be a very uncertain venture because of the widely varied overburden geology encountered throughout U.S. coal mining areas, and the lack of subsurface data upon which to base a prediction. The development of such a system for active mines would require long duration and extensive field work and therefore be quite expensive.

Question: What benefits would there be if a subsidence prediction system could be developed? Would local, state, or federal governments be interested in such predictive systems? Couldn't they help target the use of the limited funds in the Abandoned Mine Reclamation Fund? Couldn't they help local planning and land use agencies, private industry, and others choose sites for construction of facilities?

Answer: We believe there is considerable uncertainty about whether a fully reliable capability ever could be developed to predict the areal extent and timing for subsidence resulting from room-and-pillar mining. However, even where society has developed the capability to predict natural phenomena with some limited degree of precision, such predictive ability was not sufficient to result in behavior modification or public response to predicted episodes. We strongly believe that the extremely low likelihood of success of such a program coupled with its very limited predictive ability and the size of such a research program make it a very poor candidate for funding.

Question: It is my understanding that to use the $991,000 of unobligated balance in the Anthracite Mine Drainage Program, those funds must be matched on a 50-50 basis with the states. When was the last time the Commonwealth of Pennsylvania applied for this money?

Answer: We have been informed in a letter dated September 2, 1981 from Mr. Peter S. Duncan, Deputy Secretary, Department of Environmental Resources, Commonwealth of Pennsylvania, that the unobligated balance of $991,000, which is available only for Mine Water Control projects, is not planned to be matched and used. The last Public Health and Safety project application from the Commonwealth of Pennsylvania was in 1981. Public Health and Safety Project No. 13, " Filling voids in the Abandoned Empire Colliery Mine, Wilkes Barre, Luzerne County, Pennsylvania," was approved by the Secretary of the Interior in August 1981. The project, estimated at $1,800,000 by the Commonwealth, was funded sixty-percent by the Commonwealth ($1,080,000) and forty-percent by the Bureau of Mines, ($720,000). This project utilized the last of the funds available for Public Health and Safety projects.

The last application from the Commonwealth for a Mine Water Control Pumping Project was in 1975. Project No. 48 called for the installation of deep well pumps (owned by the Commonwealth) at the Hegins Mining Company's Porter Township Mine, Schuylkill County Pennsylvania at a total Federal/State cost of $170,218. This work, funded on a 50/50 basis, was completed in December 1978.

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MONDAY, MAY 3, 1982.

# FOSSIL ENERGY

## WITNESSES

**JAN MARES, ASSISTANT SECRETARY FOR FOSSIL ENERGY**

**DON BAUER, ACTING DEPUTY ASSISTANT SECRETARY FOR FOSSIL ENERGY**

**CARL GUIDICE, ACTING DIRECTOR, OFFICE OF MANAGEMENT AND PLANNING**

## OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order. This is the hearing on the fiscal year 1983 appropriations request for the Department of Energy, Fossil Energy.

Appearing in support of the appropriation is Mr. Jan Mares, Assistant Secretary for Fossil Energy, Mr. Don Bauer, Acting Deputy Assistant Secretary for Fossil Energy. Mr. Mares' biography may be put in the record at this point. And Mr. Bauer's biography may be put into the record at this point.

[The biographies follow:]

### JAN W. MARES, ASSISTANT SECRETARY FOR FOSSIL ENERGY

Jan W. Mares was nominated by the President to be the Department of Energy's Assistant Secretary for Fossil Energy on July 8, 1981. His nomination was confirmed by the U.S. Senate on July 28, 1981, and he was sworn in on August 12, 1981. In this position, Mr. Mares' major responsibilities include research and development of coal, petroleum, oil shale, tar sands and unconventional gas technologies.

Prior to his appointment, Mr. Mares' entire professional career had been with the Union Carbide Corporation. He joined the Corporation in 1963 and for 10 years was in the law department specializing predominantly in international, antitrust and commercial legal matters, and was appointed International Counsel in 1972. In 1973, he became business manager in Union Carbide's hydrocarbons department, responsible for the effort to develop a petrochemical project with an oil-producing country, and subsequently had various line and staff assignments in the chemicals and plastics area. He was named Vice President-General Manager of the Ethylene Oxide Derivatives Division in January 1980.

Mr. Mares has been a Director of Energy Resources Co., Inc. of Cambridge, Massachusetts, and is a member of the American Chemical Society, American Bar Association, and New York State Bar Association.

Mr. Mares received a Bachelor of Arts degree in chemistry from Harvard College in 1958, a Masters' degree in chemical engineering from the Massachusetts Institute of Technology in 1960, and a law degree from the Harvard Law School in 1963.

Mr. Mares was born in St. Louis, Mo., in 1936, and attended schools in Texas and Missouri. At the time of his appointment, he resided in New Canaan, CT, but has subsequently moved to Washington, D.C. He is married and has two children.

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### DONALD L. BAUER

Donald L. Bauer is the Department of Energy's (DOE) Acting Deputy Assistant Secretary for Fossil Energy, a position he assumed on February 16, 1982. Previously, Mr. Bauer served as the Acting Director of the Office of Coal Processing, where he was responsible for developing and implementing the Federal research and development program for coal liquefaction and gasification.

Prior to that assignment in June 1981, Mr. Bauer was the Acting Deputy Program Director for Project Management. He was responsible for assisting the Program Director in the design, siting, construction, and operation of major projects, including the major coal liquefaction and gasification demonstration plant projects and the Exxon Donor Solvent and H-Coal pilot plants.

Mr. Bauer also seved as Chief of Program Support (Division of Fossil Fuel Processing), responsible for Division budget development and execution, development and maintenance of management information systems, and program/project decentralization. He joined the Fossil Energy staff in 1976 as the Assistant Director, Major Facility Project Management, where he was responsible for providing management direction for procurement of major coal conversion facilities.

From 1960 to 1975, Mr. Bauer held a wide range of positions with the Department of the Army where he gained managerial experience in anti-ballistic missile systems. His positions included: Engineering Consultant responsible for the systems development activities associated with an Advanced ABM/BMD System (Site Defense); Chief of the Missile Division, Ballistic Missile Defense Systems Command, where he was responsible for the design, development, and testing of the SPRINT II and improved SPRINT II Missile Sub-System for the Site Defense System; Project Manager with the Advanced Ballistic Missile Defense Agency; Project Manager with the U.S. Army Missile Command; and Missile Test Engineer and Project Engineer in the Army Rocket and Guided Missile Agency.

Mr. Bauer began his Government career in 1958 immediately after graduating from Grove City College, Pennsylvania with a B.S. degree in chemical engineering. He served two years in the U.S. Army as a Missile Test Engineer in the Army Rocket and Guided Missile Agency, a position which he resumed as a civilian immediately after his discharge.

Mr. Bauer was born in Lucinda, Pennsylvania, and currently resides in Falls Church, Virginia.

Mr. YATES. Mr. Mares' statement may be put in following the biographies.

[The statement of Jan Mares follows:]

# The Fiscal Year 1983 Budget Request for the Federal Fossil Energy R&D Program

Prepared Statement of

Jan W. Mares
Assistant Secretary
for Fossil Energy

U.S. Department of Energy

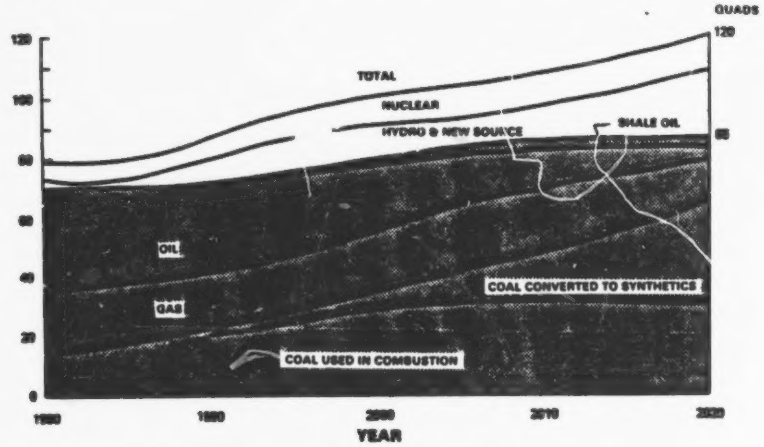
To The

Subcommittee on the Interior and Related Agencies
Committee on Appropriations
U.S. House of Representatives

May 3-4, 1982

Mr. Chairman and Members of the Committee:

The portion of the Administration's proposed fiscal year 1983 budget which we will describe today recognizes that fossil fuels -- coal, petroleum, and natural gas -- are currently the dominant suppliers of energy in the U.S. and will continue to be for decades to come. Today, 90 percent of our energy is derived from these fuels, and forecasts of the nation's energy mix well into the next century (such as the projections of the National Energy Policy Plan shown below) show a continued national reliance on fossil energy, perhaps supplying up to 70 percent of our total energy needs in the year 2020.



NATIONAL ENERGY POLICY PLAN
PROJECTED U.S. ENERGY SOURCES

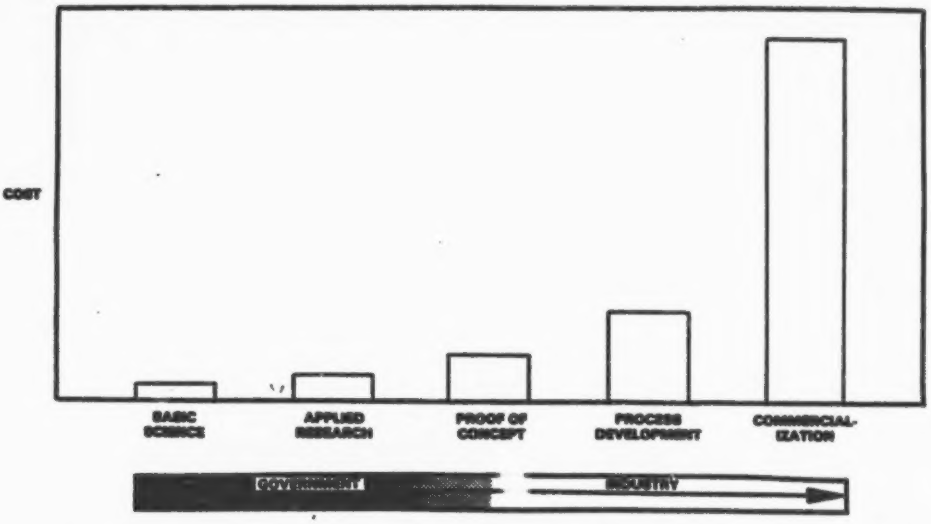
One benefit of this heavy reliance on fossil fuels is the strong technical capability of the industries that produce these fuels and that manufacture the hardware to utilize them. The policy on which this budget is based recognizes that these industries historically have propelled our nation's technological progress in energy. Given today's economic incentives, this sector is well positioned to continue and expand its role in developing and marketing new fossil energy technologies with minimum government help. Government has played an important role, most notably in such areas as coal-oil mixtures, atmospheric fluidized bed combustion, and new synthetic fuel processes, but the market continues to be the ultimate judge as well as the ultimate beneficiary of new energy technology.

Therefore, the proposed budget for fossil energy research and development in FY 1983 continues the process begun by the Administration last year to 1) reshape Federal research and development (R&D) programs to long-term, high-risk activities so they complement today's private sector initiatives, and 2) restore proper dimensions to Federal spending.

The redirection of Federal fossil energy R&D has reduced the FY 1983 funding requirement to $106.9 million, compared to the FY 1982 appropriation of $416.9 million. Within this budget, we have eliminated activities that overstep the proper sphere of Federal Government responsibilities, and we have better targeted and streamlined those generic and technology base R&D activities that remain appropriate for the Federal Government.

## THE FOCUS ON "HIGH-RISK, LONG-TERM" CONCEPTS

A central premise of this budget is that the most effective use of direct Federal outlays is through a program focused on long-term, high-risk research that is beyond the time horizons of private companies. We recognize that the description "long-term, high-risk" cannot be defined precisely; however, to describe generally the boundaries of Federal involvement reflected by this term, it may be helpful to visualize the development milestones a new technology typically passes as it moves from laboratory to marketplace. These are displayed on the following chart:



"Long-term, high-risk" research focuses the Government's role on the early stages of this development path, that is, on basic science and applied research, and, in some cases, through "proof-of-concept." These stages remain unlikely to attract sufficient private funding because of their generic or high-risk nature or the substantial time required before they return commercial benefits. Yet, the payoffs of research in these areas, in terms of improved efficiency, economics, or environmental performance, may ultimately be substantial. An additional reason why industry is reluctant to undertake basic research and development is that it cannot exclude competitors from using the results. Therefore, a further justification for Federal involvement in basic research and development is that the information generated is for the public good.

Beyond these early development stages, Government is not well suited to make the market-related judgments that govern many of the decisions. Stable economic and regulatory policies can be more effective in moving new technologies through these final phases of development and into the marketplace than direct government funding.

The diversity of fossil energy technologies required sufficient flexibility in selecting candidates for funding to accomodate such factors as:

- differences among technologies;
- differences among technology developers and users;
- changing market factors and conditions;
- the size, complexity and economic uncertainties of projects being considered; and
- the resource affected.

These factors influence the point at which private firms are willing to risk R&D funds, and where the Government's role should end.

There is no mathematical formula for drawing the line dividing the responsibility of government and industry in developing new fossil energy technologies. For most technologies, there undoubtedly will be an overlap, as evidenced by projects which involve significant co-funding. In some cases, the point at which industry assumes the initiative may not be finally known until government funding is no longer available.

The process we undertook in formulating this budget, therefore, involved balancing projects against a given set of priorities and within the context of the need for fiscal restraint. In some cases, we chose to eliminate some programs entirely rather than disperse small amounts of funding across too broad a technological spectrum. In this way, we have retained a reasonable level of activity in the highest priority programs.

## Priorities

In general, we have given highest priority to building the knowledge base so that the Nation can reduce its reliance on conventional sources of petroleum. In FY 1983, nearly 50 percent of our budget request relates directly to developing new sources of petroleum or providing substitutes for conventional liquid fuels. Research into the liquefaction of coal, the retorting of oil shale, the recovery of additional oil from conventional reservoirs, and the development of technologies that allow coal to displace oil make up the bulk of this funding.

The remainder of our budget request is divided between gaseous fuels and the direct utilization of coal. Included in the gas-related activity is the conversion of coal to a synthetic gas which, in turn, could be used as a feedstock for manufacturing liquid fuels or chemicals or for use in a fuel cell.

The direct utilization priority includes technologies for using coal in a more economical, efficient, and environmentally acceptable manner. This involves the development of various control systems for cleaning coal or removing pollutants from the combustion gases and research into improved combustion concepts.

Throughout this budget, we have also recognized that the Federal Government has traditional responsibilities relating to environmental protection, health and safety. Therefore, a significant portion of our budget emphasizes research intended to mitigate the environmental problems associated with new fossil energy technologies.

Clearly, the Federal Government cannot support research and development on all promising technologies. We have had to make hard choices on which programs to continue and which to deemphasize or eliminate. The fact that a technology is not being supported does not mean that past work in it was not useful; instead, it means that when balanced against other priorities and when considering the incentives now in place for private initiatives, our judgment was that other technical areas were more appropriate recipients of Federal dollars.

## INCENTIVES FOR NEW TECHNOLOGIES

Although not specifically part of the budget being discussed today, important aspects of the overall national energy program are the economic, regulatory and tax incentives developed by the Administration to encourage increased production and more economical use of energy. Because they are expected to provide the incentives necessary for increased private sector development of new fossil energy technologies, they form the starting point for a discussion of the Federal program in fossil energy research and development. These incentives can be summarized as follows:

Decontrol of energy prices: On January 28, 1981, the President completed the elimination of Federal price and allocation controls on U.S. oil production and marketing. The drilling industry has responded to the increased economic incentives brought about by decontrol by pushing drilling rates to record levels. In 1981, drilling in the U.S. reached an all-time high, climbing nearly 26 percent over the previous record year of 1980. Oil drilling accounted for the bulk of the increase. While the increased activity in domestic oil fields has not yet revealed another Prudhoe Bay or another East Texas, it has flattened a production trend that had curved downward for nearly a decade. Also, oil price increases have made other energy technologies, including coal combustion, economically attractive in comparison with oil. Regarding natural gas, while we continue to believe that changes to the Natural Gas Policy Act of 1978 are an essential component of a sound energy policy, the President has concluded that asking Congress to accelerate the current schedule of deregulation would overload an already-heavy legislative agenda this year.

Leasing reform: The Federal government owns or controls up to 60 percent of all U.S. energy resources, including up to 80 percent of all known coal reserves in the western U.S. A comprehensive effort to reformulate Federal leasing policies is underway at the U.S. Department of the Interior to guarantee that these energy resources can be explored and produced at a pace consistent with our national energy needs, social and environmental concerns, and the public interest.

Tax incentives: The Economic Recovery Tax Act of 1981 contains several provisions that will assist the private sector in taking a more aggressive role in energy development and production. A 25 percent research and development tax credit is designed to help restore America's technical edge by reducing the after-tax cost of R&D programs and expanding R&D expenditures. This credit may prove to be a successful market alternative to direct government grants for development of the same technologies. The accelerated cost recovery system is expected to stimulate capital investment of all forms. Petroleum production and refining equipment can be depreciated over five years. Some public utility property would get 10-year depreciation; public utility property with useful lives longer than 25 years would be limited to 15-year cost recovery.

Synthetic Fuel Incentives: On February 9, 1982, the President declared the Synthetic Fuels Corporation to be fully operational. This means that more than $14 billion in financial assistance will be available for synthetic fuel facilities. Last fall, the President approved loan and price guarantees for subsidiaries of the TOSCO Corporation and Union Oil, respectively. Each firm is involved in the construction of a commercial-scale oil shale facility. A loan guarantee also was approved for the Great Plains Gasification Associates commercial-scale coal gasification plant. Taken together, these actions are expected to give private companies the assistance they need to begin a new domestic synthetic fuels industry.

## THE FY 1983 FOSSIL ENERGY R&D BUDGET

The FY 1983 fossil energy budget proposes new funding for two of the three primary elements which have comprised past budgets. No funding is requested for the Gas program. The FY 1983 budget request is summarized below and compared with the corresponding appropriation in FY 1982 (in millions of dollars):

| | FY 1982 Appropriation | FY 1983 Request |
|---|---|---|
| Coal | $ 366.8 | $ 90.8 |
| Petroleum | 40.9 | 16.1 |
| Gas | 9.2 | ... |
| Total | $ 416.9 | $ 106.9 |

Since the proposed FY 1983 program involves a major reduction in the scope of fossil energy R&D activities, including a 55 percent cutback in personnel, the Administration had also proposed a deferral and redirection of FY 1982 and prior year appropriations to ensure that adequate funds are available for these transition expenses. The proposed deferral of $44.9 million in FY 1982 and prior year appropriations would have subsequently been used to finance the following transition activities:

- consolidation of the five Energy Technology Centers (ETCs);
- the required reduction-in-force;
- the termination of ETC contracts, where there are termination costs;
- the placing of various federally-owned pilot plants or test facilities associated with the ETCs in a "mothball" status; and
- the disposition of Federally-owned facilities.

The original deferral submission anticipated beginning many of these actions on April 1, 1982. Based on discussions with the appropriate Congressional committees, however, it was agreed to delay the actions until May to permit the Congress adequate time to review the deferral request. On April 29, the House of Representatives disapproved the deferral. The Department is currently evaluating its FY 1982 program and FY 1983 proposals to determine what adjustments may be necessary as a result of this action. The Department will continue to fund the projects referenced in the deferral request at the appropriated pace until a reprogramming request has been submitted and reviewed by the Congress.

## COAL

The abundance of U.S. coal — nearly 475 billion tons is the demonstrated reserve base according to the Department's revised estimates released last year — makes it one of the nation's strategic resources in both our energy and economic future. It has also become increasingly significant as other countries continue to turn toward a coal-rich America as a competitive, long-term and reliable source of energy.

The 1200-percent rise in world oil prices in less than a decade has imposed a substantial burden on the economies of oil-dependent nations including the U.S. But it also has created an unparalleled opportunity for America's coal production and utilization industry. The average fuel price difference between coal and oil delivered to U.S. utilities in 1973 was about $2 per barrel of oil equivalent in favor of coal. As of September, 1981, coal's domestic price advantage over oil had widened to more than $20 per barrel.

These inherent economic advantages, coupled with the recently-enacted tax incentives and the activities of the U.S. Synthetic Fuels Corporation, are expected to stimulate increased private sector development of new coal technologies. Therefore, the Federal program will concentrate on acquiring a better understanding of the fundamental behavior of coal as it is burned directly or converted to synthetic fuels and on improving significantly the current efficiency, economics, and environmental effects of coal use.

The proposed Coal program budget for FY 1983 is $90.8 million, a $276 million decrease from the FY 1982 appropriations. The components of this budget request are as follows:

Mining Research and Development: (FY 1982 Appropriation: $ 10.992 million; FY 1983 Request: $ 1.000 million)

| | FY 1983 Request (in millions) |
|---|---|
| Underground coal mining.................. | $ 1.000 |
| Surface coal mining ..................... | ... |

The long-term development of advanced underground coal production systems and techniques has been shifted from primarily a contract effort to a largely in-house research program. The Administration will propose transfer of the DOE Mining R&D program to the Department of the Interior's Bureau of Mines which conducts similar research activities. This year, the necessary project reviews and facility and equipment inventories will be completed with the Bureau. Previous research efforts conducted by private firms under DOE contract will be closed out or phased down except for those proposed for continuation in the course of discussions with DOI.

Activities continued in FY 1983 will assess the technical feasibility of advanced and novel mining concepts and on previously-funded, long-term trials of advanced longwall mining techniques.

Longwall mining, although accounting for only 5 percent of the nation's underground coal production, nevertheless offers the potential for significant improvements in productivity, worker safety, and the capability to mine deep and multiple seams. These improvements will become increasingly important as shallower deposits are exhausted and miners must move deeper underground and face more difficult conditions. The Federal program in FY 1983 will concentrate on determining the forces and loads on key longwall equipment, using both underground trial data and the program's unique Mine Roof Simulator located at the Pittsburgh Energy Technology Center. Studies will also be made on the systems which guide the longwall shear across the coal face in an effort to overcome current control and alignment problems.

In the room-and-pillar area — the mining technique accounting for 95 percent of the Nation's underground coal production — the Federal effort will continue assessing means by which advancements in the roof-bolter, miner-bolter, and continuous haulage system can be better integrated.

In past budgets, coal preparation activities were part of the Mining R&D program. In FY 1983, these activities are shifted to the Control Technology and Coal Preparation program under the heading "Coal Preparation and Analysis." These activities are not proposed for transfer with the Mining R&D program.

Liquefaction: (FY 1982 Appropriation: $ 98.784 million; FY 1983 Request: $ 26.200 million.)

| | FY 1983 Request (in millions) |
|---|---|
| Direct Hydrogenation | |
| H-Coal pilot plant .................. | $ ... |
| Solvent Extraction | |
| Exxon Donor Solvent pilot plant...... | ... |
| Advanced Process Development | |
| Disposable catalyst ................. | 4.200 |
| Process research/technology development....................... | 9.600 |
| Indirect Liquefaction................. | 8.400 |
| Support Studies/Eng. Evaluations | |
| Environ. studies & other support .... | 4.000 |

Liquids remain a primary source of national concern about energy. Although significant potential exists for discovering new sources of conventional petroleum or increasing production from known oil reservoirs, the magnitude and geographical diversity of the nation's coal deposits makes it highly likely, and perhaps necessary, that this resource eventually will be used to increase the supply of liquid fuels. Today, several commercial projects that would convert coal to liquid fuels are being considered by the U.S. Synthetic Fuels Corporation. Most would rely on the "indirect" liquefaction process, where the coal is first gasified, then the gases catalytically recombined to form liquids.

Direct liquefaction — converting coal to liquids without the initial gasification step — offers the potential for improved efficiencies and lower costs. Completion of the government's programs at the 200-ton per day H-Coal and the 250-ton per day Exxon Donor Solvent direct liquefaction pilot plants in FY 1982 will provide a sound technology base for continued development and scale-up of these processes for commercial use by the private sector.

The focus of FY 1983 activities will be on exploring new concepts offering significant improvements in efficiency and economics compared to the H-Coal and Exxon Donor Solvent processes. Information learned from these activities could form the basis for new generations of synthetic fuel technologies in the 1990s and beyond. Much of the Federal direct liquefaction program will concentrate on advanced process development to attain higher thermal efficiencies by reducing the amount of steam, oxygen and/or hydrogen required in the conversion process. One way to do this is by improving the effectiveness of catalysts and minimizing the dependence on high temperatures to break apart the coal structure. By developing cost-effective ways to use these catalysts, the reactivity of the feed coal can be controlled more precisely and undesirable trade-offs in plant design and operating efficiency can be avoided. Improved operating efficiency and better yields of fuel products could be achieved by future plants as a result of this research.

Another approach being pursued in FY 1983 is to separate the step in which coal is dissolved from the step in which the coal extract is upgraded to a higher-quality liquid -- an innovative technique called "Integrated Two-Stage Liquefaction." Bench-scale tests have shown that product yields can be increased by 25 percent over the direct liquefaction processes now at the pilot scale with higher quality liquids produced and less hydrogen being consumed. One of the major efforts in this activity will be to investigate a low-temperature second step that could prolong catalyst life while improving the recycle solvent needed for the dissolving step and to transport hydrogen to the coal extract.

Sufficient funds are expected to be available from FY 1982 to continue long-range liquefaction research at the Wilsonville, Alabama, 6 ton-per-day liquefaction facility in FY 1983. This unit is owned and operated by the Electric Power Research Institute which will supplement DOE funding during 1983.

In the indirect liquefaction area, a combination of laboratory and bench-scale efforts will concentrate on new methods of converting the carbon monoxide and hydrogen from coal gasifiers into alcohols or liquid hydrocarbons. A broad-based catalyst and process R&D program is now in place which could result in significant advances in the production of high quality gasoline and/or middle distillates with yields 20-30 percent higher than those of conventional methods. Testing will also be done on new reactor designs that enable closer control of the reaction temperature and more effective recovery of the heat released by the reaction. Research on these new concepts could lead to cost savings of up to 40 percent compared to existing indirect technology.

Transition to the FY 1983 funding level will require eliminating the La Porte, Tex., liquid phase synthesis unit. This facility would have tested alternative methods for producing alcohols and liquid hydrocarbons from gas typical of that from advanced coal gasifiers. Termination of this activity is an example of the judgments necessary when technologies with varying degrees of potential were balanced against the need to limit Federal spending. Given industry's technical understanding of this technology and the obvious economic incentives which would accrue to firms that perfect commercial processes, we believe there are adequate incentives for private industry to continue to develop this process. Our judgment is that more significant benefits could be obtained by investing Federal funds in the development of more effective catalysts and other process improvements.

Also in the indirect liquefaction activity, the internationally sponsored 100 barrel-per-day methanol-to-gasoline (M-Gasoline) pilot plant will be completed in the Federal Republic of Germany in FY 1982. In FY 1983, DOE will collect data on the effectiveness of the advanced "fluidizing" technique employed by the plant to improve temperature control and the effectiveness of the catalyst. Involvement of both the German government and industry and the high probability of royalty payments exceeding the U.S.'s investment in the project are the major reasons for proposing to complete this project.

Support studies and engineering evaluations will be conducted to provide independent technical status reviews, engineering assessments, evaluations of ancillary processes (such as hydrogen generation), and environmental and toxicology R&D and coordination.

The Department also proposes to deliver to the Congress by June 1, 1982, the SRC-I demonstration plant project baseline cost and schedule. Disposition of funds remaining from the $129.6 million deferred from FY 1981 for this activity will be addressed by a subsequent Administration proposal to Congress.

Surface Coal Gasification: (FY 1982 Appropriation: $ 53.088 million; FY 1983 Request: $ 10.500 million)

| | FY 1983 Request (in millions) |
|---|---|
| Advanced Process Development ...... | $ 4.250 |
| Systems Engineering Concepts | |
| Gasifier systems ................ | ... |
| Equipment/instrumentation ....... | 3.000 |
| Environmental and Engineering Analyses | |
| Environmental studies ........... | 3.250 |
| Engineering analyses/support .... | ... |

To ensure that new concepts for converting coal into synthetic gas continue to enter the development cycle and that problems generic to many gasification processes are overcome, the Administration has established three primary objectives for its surface coal gasification program:

(1) explore and determine the applicability of alternative chemical processing principles and fluid dynamics as possible ways to improve the overall efficiencies and economics of coal gasification;

(2) develop new and promising approaches through the "proof-of-concept" stage for medium-Btu gas that could lower product costs by at least 20 percent as compared to first-generation processes. Medium Btu gas would be emphasized because of its wide diversity of applications including industrial and electric utility uses, conversion to a variety of liquid fuels as well as to synthetic natural gas, or for use as a feedstock for manufacturing chemicals; and

(3) compile a data base on environmental, worker health, and occupational safety performance of commercial and pilot-scale gasification systems and, based on the results, develop effluent treatment concepts capable of meeting existing emission limits as well as workplace safety and health requirements.

A comprehensive technology data base for new gasifier concepts and systems will be established under the advanced process development budget category. Included in the data will be information on process fundamentals, results of new waste water treatment techniques, computer modeling of gasification reactors, and the collection of basic information on all phases of coal gasification, from coal feed through gas cleanup and effluent disposal. The data will include test results from small entrained and fluidized bed reactor systems and could offer the basis for significant long-term improvements over conventional fixed bed gasifiers such as the dry-ash Lurgi. Particularly important will be data which could give new insights into why some coals cake during gasification as well as a more fundamental understanding and control of sintering, clinkering, and slag formation in various gasification systems. Basic experiments will also be conducted on waste water treatment processes and other environmental control systems associated with coal gasification processes.

Operating a coal gasification facility reliably, economically, and efficiently depends substantially on the availability of suitable equipment, instrumentation and control systems, as well as proper materials and fabrication methods. Previous pilot and smaller-scale operations have shown some inherent drawbacks in relying on equipment and technology from other industrial processes, due primarily to the unique combination of high temperature, high pressure, and the erosive and corrosive environments within coal gasification systems. The focus of the systems engineering concepts activity in FY 1983, therefore, will be to investigate new ways to measure key conditions encountered in a gasification facility, such as solids/gas flow, high temperatures, stream composition, erosion and corrosion in process lines, etc. This work will be performed in laboratory test loops. The effects of slag additives on gasifier refractory life will also be assessed in specially designed laboratory equipment, and generic studies will continue on metal coatings and claddings that can withstand the effects of hot coal gases.

No funding has been requested in FY 1983 for developing individual gasifier systems. Several advanced gasifiers have emerged from the prior Federal program, such as the Westinghouse fluidized bed gasifier, U-Gas, and the Exxon catalytic gasification system. The first commercial-size project, the Great Plains Gasification plant, is now moving forward, and knowledge gained from this facility as well as directed bench scale studies will be sufficient to optimize these new technologies. (The Government's monitoring of the Great Plains loan guarantee in FY 1983 will use funds left unspent from the Alternative Fuels administrative account. The anticipated FY 1983 requirement for administering the loan guarantee is $2.4 million.)

Emphasis was increased in FY 1982 on attaining a better understanding of the environmental aspects of converting coal into synthetic gas, and in FY 1983 that emphasis will continue. As part of the environmental studies effort, a gasification cleanup system will be operated under transient conditions and studies will be made to determine the efficiency losses associated with operating a cleanup system under actual end-use conditions. This is expected to lead to more effective designs of environmental control equipment.

Underground Coal Gasification: (FY 1982 Appropriation: $ 8.256 million; FY 1983 Request: $ 0.700 million)

| | FY 1983 Request (in millions) |
|---|---|
| Gasification Technology Development ..... | $ ... |
| Environmental and Advanced Research ..... | .700 |

Techniques that gasify coal underground are particularly applicable to coal seams that are too deep and thick or that are pitched at too great an angle for effective mining. Synthetic gas produced from this technique can be converted into transportation fuels such as methanol and gasoline, used as a fuel for electric power generation or as a feedstock for chemical manufacturing, upgraded to synthetic natural gas, or at some specific sites, as a generator of $CO_2$ for enhanced oil recovery and hydrogen for refinery use or shale oil upgrading.

In FY 1982, the concept of gasifying steeply dipping beds and producing a medium-Btu gas was proven at a site in Wyoming, and large block tests from a Washington coal seam will soon be completed to determine cavity growth and coal response. As a result, the need for futher Federal support of technology development has been diminished, and further technology development is expected to be undertaken by industry. Consequently, the Federal effort will concentrate on legally-mandated environmental monitoring and research at past test sites.

Advanced Research and Technology Development: (FY 1982 Appropriation: $56.256 million; FY 1983 Request: $19.800 million)

| | FY 1983 Request (in millions) |
|---|---|
| Processes .......................... | $ 5.000 |
| Direct Utilization .................. | 4.200 |
| Materials & Components | |
| Materials .......................... | 3.940 |
| Components ......................... | .860 |
| Program Development & Coordination | |
| Budget & administration (construction) .................... | 2.800 |
| Environmental activities .......... | 2.000 |
| Planning & policy ................. | 1.000 |
| University coal research ............ | ... |

The Advanced Research and Technology Development (AR&TD) program is aimed at extending the fundamental scientific and engineering knowledge base for fossil energy. In this activity, a better understanding is gained of the fundamental mechanisms of converting coal to gas and liquid fuels or burning it directly. Also included are generic studies of materials and components which have application across the fossil energy spectrum. In conducting these activities, scientists will hopefully develop ideas for new processes and possible technical breakthroughs in coal conversion and utilization.

The AR&TD program differs from other activities in the Coal program in that it addresses broad technological problems applicable to many facets of the Fossil Energy coal program. Yet, projects supported by the AR&TD budget remain closely connected to long-range Fossil Energy objectives, thus distinguishing the program from the more general mandate of the agency's Office of Energy Research.

Out of this activity, for example, has come a better understanding of coal chemistry, the structure of coal, and the role mineral matter plays in coal conversion. Innovative approaches for upgrading low or medium Btu gas to methane have emerged from AR&TD research, as did the pioneering work establishing the early viability of coal-water mixture combustion. The diversity of the research is reflected by the fact that this activity has also included studies of the mechanisms of soot formation from the burning of synthetic fuels, the identification of critical composition and microstructural aspects of ceramics, and the exploration of new approaches to recovering useable heat from effluent gas streams.

In FY 1983, the processes budget category will include work in both liquefaction and gasification. Small scale research in the liquefaction area will include studies of the generic mechanisms of coal liquefaction, in addition to research on advanced catalysts. Other projects will investigate the effects of mineral matter on the kinetics of coal liquefaction. The gasification activity, likewise, includes pioneering research across a broad technical front involving kinetics, thermodynamics, catalytic mechanisms, modeling, hydrogasification, pyrolysis, fluidization studies, acid gas removal, hot gas cleanup, gas separation, conversion studies, and novel concepts for generating synthetic gas by reaction with steam, air, and oxygen. These activities will generate important data which will be used to construct a sound fundamental synthetic fuels technology base

The direct utilization effort will expand the technology base required for the increased use of coal including low-rank coals, chars, beneficiated coals, and coal-liquid mixtures. Approximately 50 individual efforts will address areas such as fuel injections and preignition processes, flame chemistry, pollutant formation and control, fouling and slagging, and modeling and scaling techniques. Emphasis will be given in FY 1983 to developing a data base required for retrofitting oil and gas designed equipment for coal firing and expanding coal firing options in industrial process heat applications.

The materials activity will provide the data for future decisions on structural materials in fossil energy conversion systems and could lead to materials with higher efficiency and greater longevity. The program will attempt to gain a better understanding of the basic phenomena of material degeneration in fossil energy systems.

The components program will continue fundamental research into the peripheral and support equipment involved in fossil energy utilization. Specific research will focus on advances in analytical models of flow patterns when solids, liquids and gas are mixed (called "three phase flow"), the development of a thermodynamic base for heat exchangers and the development of scaling parameters for multi-phase flow systems.

The funding request for budget and administration includes $1 million for incremental funding of the construction and initial equipping and operation of a surface water containment and waste water treatment facility at the Pittsburgh Energy Technology Center so that current violations of waste discharge regulations can be corrected. The remaining $1.8 million is for a waste water treatment facility at the Morgantown Energy Technology Center and for other general plant projects at the Energy Technology Centers. The Department is currently planning a major consolidation of the Fossil Energy field structure, aimed at reducing the number of Energy Technology Centers from five to perhaps two. If, as a result of these actions, these general plant projects are not required, an amendment will be forwarded to the Congress.

Funding for environmental activities will finance policy development, R&D assessment and compliance overview in the areas of environment, safety, and health. This activity will ensure that fossil energy projects are conducted in compliance with relevant laws and regulations, such as the National Environmental Policy Act, the Clean Air Act, the Occupational Safety and Health Act, and others. By involving environmental, health and safety concerns early in the technology programs, the future acceptability of new process concepts emerging from the Fossil Energy program can be assured.

Planning and policy funding will be used to conduct contract studies and data collection on a variety of fossil energy related topics which will be valuable for planning future research and development activities. Administrative support for the Fossil Energy program is also provided under this budget category.

No funds have been earmarked specifically for university activities in FY 1983 since government-supported university projects can be found throughout the Fossil Energy program and in other Departmental programs.

Combustion: (FY 1982 Appropriation: $ 30.544 million; FY 1983 Budget Request: $6.500 million)

| | FY 1983 Request (in millions) |
|---|---|
| Atmospheric Fluidized Bed Combustion ........................ | $ ... |
| Pressurized Fluidized Bed Combustion | |
| IEA Grimethorpe PFB ............. | 2.500 |
| PFB Technology Base Support...... | 2.000 |
| Alternative Fuel Utilization | |
| Alternate fuel mixtures ......... | 2.000 |

Industry has now assumed the lead in developing and marketing several new coal combustion techniques, including atmospheric fluidized bed combustion systems. At least 35 atmospheric fluidized bed boilers are now in operation, under construction, or being designed, and at least 10 boiler manufacturers are now developing or marketing commercial versions of this new combustion technology.

As a result, the Federal combustion research program in FY 1983 will concentrate on technology base research for pressurized fluidized bed (PFB) combustion and support for the international experimental pressurized fluidized bed facility at Grimethorpe, England. The pressurized fluidized bed approach represents the next generation of advanced coal combustors. The International Energy Agency's Grimethorpe program will focus on evaluating combustor performance, coal feeding, ash removal, and gas stream cleanup. This project has special significance because of the international cooperation it entails with Great Britain and the Federal Republic of Germany. Construction of the unit has been completed and the first test runs have taken place. The $2.5 million requested in FY 1983, along with funding from our international partners, is expected to be sufficient to develop a sound data base for the pressurized fluidized bed combustor, the heart of this advanced combustion concept. We will also continue to assist in efforts to interest other governments or industries in sponsoring the follow-on phase of the project which would include modifying the facility to incorporate a gas turbine.

While no funding is requested for the Wood-Ridge, New Jersey, pressurized fluidized bed facility, construction is continuing in FY 1982 and negotiations are underway to reduce Federal involvement in completing the construction and operation of this facility.

The PFB technology base support will concentrate on the basics of fluidized bed combustion at pressures of up to 20 atmospheres. Corrosion and erosion of various boiler and gas turbine materials will be studied, scale-up laws will be better defined, and an investigation of the effects of tube bundle solidity on heat transfer and studies of the combustion characteristics of coal-based mixtures and low rank coals will be conducted.

Industry has also assumed the initiative in commercializing coal-oil mixtures, in some cases using data generated in past government research programs. The alternative fuel utilization program, therefore, will focus on higher-risk coal-based slurry fuels, such as coal-water and coal-water-alcohol. Coal-water mixtures, particularly, have attracted substantial interest recently because of their potential for replacing 100 percent of the oil burned in a utility or industrial oil-designed boiler. Mixtures of up to 70 percent coal and 30 percent water have been shown to have storage, handling, and transportation characteristics compatible with conventional oil-handling equipment with only modest modifications. The Department recently selected two firms to perform a series of tasks intended to build a sound data base for industry to make future commercial decisions on coal-water mixtures. If this data, coupled with information developed by an on-going in-house research program, is successful in stimulating industry to move ahead on its own, as much as 3 million barrels per day of oil could be displaced in major fuel burning installations across this country.

Control Technology and Coal Preparation: (FY 1982 Appropriation: $ 25.152 million; FY 1983 Request: $ 8.600 million)

| | FY 1983 Request in millions |
|---|---|
| Coal Preparation & Analysis ......... | $ 2.000 |
| Flue Gas Cleanup | |
| Combined flue gas cleanup .......... | 3.000 |
| Gas Stream Cleanup | |
| Turbine cleanup systems ............ | 1.500 |
| Fuel cell cleanup systems .......... | 1.200 |
| Process modification technology .... | .500 |
| Cleanup Base Technology ............. | .400 |

The economics of producing energy from coal are penalized by sulfur and ash-forming impurities in the coal. Added costs are incurred in transportation, capital investment, operation and maintenance, impaired plant reliability, environmental control, and waste disposal. Today's commercial coal users are limited in their methods of removing these impurities. Significant benefits could be gained if future plant operators could make tradeoffs between a wider variety of coal preparation methods applied before coal is shipped, and improved combustion gas clean-up systems installed at the plant site. To assist industry, therefore, the Federal R&D program has been restructured to treat the entire coal cleaning process — from mine to stack — as successive, interdependent steps.

The first step in this "control systems" approach is to remove sulfur and ash from coal by precombustion cleaning, or coal preparation. The more of these impurities that can be removed, the greater the potential savings in transportation, power generation, and environmental costs. Many U.S. coals resist extensive cleaning unless they are ground considerably finer than present day technology allows. Our goal is to develop techniques to grind coal as much as 60 times finer than is common in today's coal preparation plants. Once this is done, fine coal physical cleaning can remove the bulk of ash-forming minerals and the mineral sulfur or iron pyrite in coal. An even higher quality product can be obtained by extracting most of the remaining organic sulfur (which is chemically bound to the coal structure) and residual mineral matter by chemical cleaning.

The Federal program addresses these challenges. Our efforts are intended to aid the private sector in developing methods to clean even inferior U.S. coals to qualities approaching fuel oil. Our research to date gives us strong encouragement that this can be done. If we establish the necessary firm technology base and validate cost-effectiveness through credible "proof-of-concept" engineering tests, the private sector will move ahead to full commercial development. Two advanced chemical methods, microwave desulfurization and fused salt treatment, appear particularly promising and development of both will continue in FY 1983.

With industry assuming much of the initiative in moving new flue gas desulfurization technologies -- or "scrubbers" -- into commercial practice, the Federal program is now focusing on a significantly more advanced generation of flue gas cleanup systems. Emphasis is being placed on electrochemical or chemical systems which simultaneously remove both $NO_x$ and $SO_2$ in a single reaction, rather than in a series of separate steps as is the practice today. The FY 1983 budget would continue research on electron beam irradiation and advanced chemical processes begun in 1981. University-level testing of advanced particulate control will also continue.

To improve the prospects for new combined cycle generating systems powered by synthetic gas from coal or the exhaust from a coal-fired pressurized fluidized bed combustor, government research will also continue in turbine cleanup systems. Efforts in FY 1983 will continue projects begun in prior years to improve methods for removing alkali and particulate impurities from hot (up to 2400 degrees F), high pressure (500 psi) gas streams before they can damage conversion cycle equipment and/or violate environmental emissions standards. "Proof of concept" tests will be conducted under actual pressurized fluidized bed combustor conditions using a variety of coals.

The aerodynamics/materials problems associated with high-speed turbomachinery do not exist when coal gasifiers are linked to the molten carbonate fuel cell. The fuel cell, however, is susceptible to electrode poisoning and/or deterioration, and electrolyte contamination. Therefore, the Control Systems program also includes a fuel cell cleanup system activity to quantify the limits of contaminants acceptable to the molten carbonate fuel cell, to evaluate the applicability of state-of-the-art gasifier cleanup systems to fuel cells, to determine the incentives for developing high temperature fuel cell cleanup processes, and to build the technology base so that industry can develop the most appropriate cleanup systems.

An alternative to flue gas cleanup or the use of separate cleanup equipment for hot gas cleanup may be to modify the combustion or gasification process itself to either suppress pollutant formation or remove the pollutant as it is formed in the gas. This approach is being pursued under the process modification technology budget category. To determine the most desirable approaches, a better understanding is needed of the mechanisms by which pollutants are formed along with their chemical make-up. Once specific control techniques are conceived, they must undergo technical and economic feasibility tests to determine the requirements for further development. In FY 1983, an assessment of the most desirable $NO_x$ control techniques, centering on combustion modification and catalytic combustion, will be completed. Guidelines for selecting physical/chemical techniques for $SO_2$, alkalies, trace metals, and hydrocarbon capture or destruction will also be determined.

The cleanup base technology activity has been revised to focus on combustion system waste management and characterization, and will emphasize two projects: waste sampling and characterization, and assessments of the Resource Conservation and Recovery Act and other environmental regulation impacts on coal-fired utilities.

Fuel Cells: (FY 1982 Appropriation: $34.464 million; FY 1983 Request: $ 9.500 million)

| | FY 1983 Request (in millions) |
|---|---|
| Phosphoric Acid Systems Development......... | $ 5.000 |
| Molten Carbonate Systems Development........ | 3.500 |
| Advanced Concepts........................... | 1.000 |

Because fuel cells generate electricity and heat by electrochemical reactions, and not by combustion, they have particularly attractive environmental, efficiency, and siting flexibility benefits. Applications range from electric utility multi-megawatt power plants to on-site multi-kilowatt cogenerating systems for transportation and defense facilities.

During FY 1982, power will be produced from the nation's first prototype utility fuel cell, the 4.8 megawatt phosphoric acid demonstrator power plant in New York City, and development will continue on critical technology components and subsystems required to improve system life, power density, and costs. Also, the first field tests of the 40-kilowatt on-site power plants will begin, and the first 40-kilowatt systems will be delivered under a joint DOE/Gas Research Institute field test program. The FY 1983 phosphoric acid systems development program will complete the retrofit of the fuel cell stack for the 4.8 megawatt power plant and will provide funding for completion of development activities for the electric utility technology development program. Phosphoric acid fuel cell technology has reached the stage where the private sector can now begin assuming responsibility for manufacturing and marketing the technology.

Second generation molten carbonate fuel cell systems development will also continue in FY 1983 with emphasis on critical technical issues. While both phosphoric acid and molten carbonate fuel cells can be linked to a coal gasifier, a particular advantage of the molten carbonate system is that it can be combined with a steam or a gas turbine thereby boosting the system's overall efficiency. In FY 1983 a selected stack of sub-scale size molten carbonate fuel cells will be operated, a commercial-type cell will complete long-duration test operations totaling 10,000 hours, and an evaluation of the system's capability to operate on coal-derived gas will be undertaken.

The advanced concepts program focuses on the solid oxide fuel cell, a design concept which offers the advantages of solid state stability and more simplified production. The funding requested in FY 1983 would complete a 5,000 hour test of an advanced design cell, permit preliminary design of a 5-10 kilowatt stack module, continue follow-up analysis and development of advanced concepts for mobile applications, and complete the initial R&D requirement for solid oxide fuel cell configurations.

Heat Engines: (FY 1982 Appropriation: $ 15.408 million; FY 1983 Request: $ 0)

The Heat Engines program in prior years contained a variety of associated activities, including the high temperature gas turbine cooling and low NOx combustor technology; gas turbine and diesel engine materials and coating development, externally fired heat engine cycle work, and feasibility testing of diesel engines and gas turbines on coal-derived liquids and coal-water mixtures.

These activities are approaching the "proof of concept" point where the private sector is provided the option to continue further development. Many of the technology improvements supported by this program could eventually be undertaken by manufacturers as they make advances in existing technologies. Therefore, no funds have been requested in FY 1983 for continuing this program.

Magnetohydrodynamics (FY 1982 Appropriation: $21.840 million; FY 1983 Request: $ 0)

The Administration also proposes to phase out the overall magnetohydrodyamics (MHD) program beginning in FY 1982, and no funds are requested for FY 1983. MHD is a technology that requires a large-scale "proof of concept" demonstration (in the range of a 250 to 300 thermal megawatt facility) with attendant development costs approaching perhaps $500 million. In light of budgetary constraints, the multiple energy conversion technologies presently being pursued by both private industry and the Fossil Energy program, and the relatively high development costs and relative expected benefits of MHD, the Administration cannot continue funding support for this technology.

## PETROLEUM

The target for recovering new supplies of oil in the U.S. is extremely large. Nearly 450 billion barrels of oil have been discovered, yet only one-quarter of that has been produced. Best estimates are that 28 billion barrels of reserves remain to be produced through conventional recovery methods. To date, the contribution of enhanced oil recovery has been roughly 400,000 barrels per day, nearly three-fourths of which is produced by steam injection in heavy oil reservoirs. Over the longer-term, however, enhanced oil recovery is expected to increase, particularly with the incentive of decontrolled oil prices. The focus of the Federal research effort, therefore, is to concentrate on more generic technology base research, leaving to industry the task of bringing technology to commercial readiness.

Oil shale is another potential source of unconventional petroleum supplies. Several retorting processes are considered commercially feasible today. The companies involved in oil shale projects have the financial and technology resources to commercialize existing and new technologies. Therefore, the government's efforts will concentrate on generic research on the chemistry and physics of western oil shale processing and on explosive fracturing. Work will also continue on the potential environmental effects of oil shale development and their mitigation.

Enhanced Oil Recovery (EOR): (FY 1982 Appropriations: $ 16.176 million; FY 1983 Request: $5.8 million)

| | FY 1983 Request (in millions) |
|---|---|
| Heavy Oil | $ 1.9 |
| Light Oil | 3.9 |
| Tar Sands | ... |

Because private industry can be expected to continue to improve existing EOR processes and eventually to develop new concepts in response to oil price increases, the Federal EOR program is now directing its primary emphasis on long-range, high-risk technology base research that attract limited private capital.

The heavy oil program will continue to concentrate on improving the recovery efficiency of thermal processes. If recovery efficiency can be improved from the current 50 percent to a level of 60 percent, an estimated two to three billion barrels of oil could be added to the nation's recoverable reserves. Similarly, if heat losses can be reduced in wellbores, thereby permitting steam to be piped to deeper reservoirs, domestic reserves could be boosted by one to two billion barrels. In FY 1982, the long-term test of the downhole steam generator, part of Project Deepsteam, will be completed. The significant private sector interest in this concept has eliminated the need for additional development by the Federal government. The FY 1983 funding request, therefore, provides for continued research into the behavior and mechanisms of heavy oil recovery. Research would continue to investigate flow properties, the kinetics of in situ combustion, and steam mobility control. Evaluations of chemical additives with steam and studies of foams and other ancillary materials for improving sweep efficiency, mobility control, and environmental effects would also continue.

The light oil funding request, likewise, would continue fundamental research into the behavior and mechanisms of light oil EOR processes, including chemical and miscible gas flooding. Research will be conducted into mobility control, the interfacial tension effects between oil, chemical, and water molecules, the stability of chemicals at the elevated temperatures and increased brine salinity encountered underground, basic studies on how oil drops coalesce, and in several other areas. The research will be conducted in-house and at several universities, and several ongoing, previously funded, cost-shared field tests will continue to be monitored.

The private sector has adequate incentive to continue development of tar sands in view of the current state of the technology, the decontrol of oil prices, the existence of the Synthetic Fuels Corporation, and recent regulatory changes allowing tar sand leasing on Federal lands. Therefore, no further federal R&D is warranted and no funding has been requested for FY 1983. Activities related to the in situ tar sand experiments at Vernal, Utah would be phased down and concluded in FY 1982.

Advanced Process Technology: (FY 1982 Appropriation: $ 4.032 million; FY 1983 Request: $ 3.000 million)

| | FY 1983 Request (in millions) |
|---|---|
| Advanced Exploratory Research ......... | $ 3.0 |

A variety of generic and fundamental supporting research activities related to oil, gas, oil shale, and tar sand resources are conducted under this budget category. For example, a portion of the Advanced Exploratory Research budget will permit continued experimentation on the use of microbes for enhanced oil recovery. Researchers will attempt to identify and isolate microbial strains that can survive and generate through a biological process, surfactants, polymers, emulsifiers and other chemicals under reservoir conditions. Research will also be done on advanced recovery methods using vacuum extraction, superheated water, and novel solvent products. Studies to remove mutagenic, carcinogenic, and other toxic products from heavy crudes, tar sand bitumen, and shale oil will be pursued, as well as supporting research into the stability, degradation mechanisms, and rheology of synthetic fuels. Analytical support will also be provided to the Strategic Petroleum Reserve Office.

A variety of "cross-cutting" research applicable to all petroleum-related programs will also be conducted. This will include efforts dealing with rock mechanics, improved analytical methodology, and instrumentation for studying the physical and chemical properties of fossil derived liquids and for aiding in the extraction of gas from tight reservoirs. Another aspect of this program involves fundamental research into the existence and magnitude of abiogenetic methane and methane hydrates, as well the evaluation of the potential for recovering these unconventional resources.

Oil Shale: (FY 1982 Appropriations: $19.152 million; FY 1983 Request: $6.300 million)

| | FY 1983 Request (in millions) |
|---|---|
| Technology Base.............. | $ 3.700 |
| Environmental Mitigation..... | 2.600 |

Oil shale technology is now making the transition from laboratory and pilot scale testing to the first commercial applications. Initial private sector activities are concentrated in the western U.S. where the richest reserves of oil shale lie. Substantial lower quality resources also exist in the eastern states. Together, the oil potential represented by U.S. oil shale deposits is much greater than all of the oil reserves of the Middle East.

As privately-initiated projects continue to move forward, the Federal program will limit its oil shale technology base activities to generic research on the chemistry and physics of western oil shale processing and on explosive fracturing. If a better understanding can be developed in these areas, future oil shale processes could achieve significantly higher conversion efficiencies and fracturing could be done with greater predictability. Examples of this work include the development and application of improved X-Ray, nuclear magnetic resonance, and other analytical techniques for application to shale oil products and chemical reactions. Funding for previous development and demonstration projects, conducted under cost-sharing contracts, will be completed in FY 1982, and the FY 1983 budget level represents the winding down of related evaluation activities, phase out of further technology base research on eastern shales, and postponement of R&D on specific process concepts.

While the first shale oil production plants will be able to comply with current environmental standards using conventional technology, the long-term accumulation of such facilities in environmentally-sensitive areas could require improvements in environmental control technologies. Therefore, a prime focus of the Government's research program will deal with environmental mitigation. The proposed budget would permit a study of the relationship between process conditions and the efficacy of sulfur removal as well as the chemistry of formation and control of other air emissions. Also, laboratory experiments would be continued to develop solid waste management strategies, including the preparation of an integrated solid waste management plan. Studies would also continue on potential water purification techniques, and a waste pile stabilization plan would be completed for the government-owned Anvil Points facility in Colorado.

## GAS

Natural gas currently supplies about one quarter of the total energy consumed in the U.S. While the annual addition of gas reserves from new discoveries has been less than withdrawals from proved reserves for almost the last decade, the difference between additions and withdrawals has decreased steadily as exploration has picked up with phased energy price decontrol.

The Federal research role in this area has historically concentrated on unconventional sources of natural gas such as eastern shales, western tight sands, and coalbed methane. Industry efforts are now increasing in these areas, and the private sector has both the financial and technical resources to develop these new gas resources in response to market incentives. Consequently the unconventional gas recovery program has been scheduled for termination in FY 1983.

Unconventional Gas Recovery: (FY 1982 Appropriation: $8.712 million; FY 1983 Request: $ 0)

Industry has already begun to develop western tight blanket sands. As that technology evolves to cover the more difficult lenticular deposits, production from this resource should increase. And because there is a strong link between unconventional technology development and economic incentives, Federal activities in this area can begin to phase down. The resource evaluation for eastern Devonian shales is essentially complete and final verification of the results is expected to be done by industry. Thus, all geologic resource assessment activities will be phased down in FY 1982 and will no longer be supported by this program. Previous government-funded activities have demonstrated that methane can be extracted from coalbeds and used both with and without associated mining operations. The industry is better qualified to deal with barriers to commercial production and gas ownership; therefore, uo funds are requested for this program in FY 1983.

Work in FY 1982 will be confined mainly to bringing the multiwell test in the western lenticular tight sands to a successful completion. To achieve a smooth shutdown of the Federal unconventional gas program, the Administration is proposing to cancel the third well of the multiwell project and eliminate all research dependent upon that well. Research at the site is proposed to be completed in FY 1982 with termination in FY 1983 or transfer of the project to industry.

## PROGRAM DIRECTION

The FY 1983 request of $9.0 million for program direction ($8 million for the Coal program and $1 million for the Petroleum program) will provide funds for salaries, benefits and travel for Fossil Energy headquarters personnel during the fiscal year. Funding of these expenses for the Energy Technology Centers is provided in the program activities they support, not from the Program Direction line item.

## CONCLUSION

In the past the Federal government has focused heavily on budgetary spending for fossil energy. In focusing on federal spending, the government in our view, failed to deal with the basic problems affecting energy in this country. For example, past policies artificially held the price of oil and natural gas below market levels. This discouraged the use of substitute fuels such as coal and also discouraged energy conservation and further discovery of oil and gas. The alternative approach, proposed by the President, involves a much broader strategy regarding energy and the overall economy. The funding proposed for the Fossil Energy programs should be judged in the context of this broader strategy involving less government spending, regulation, and taxation to achieve a simple energy policy objective -- the encouragement of efficient production and use of domestic energy resources.

The fossil energy budget we have proposed is part of an overall Federal energy budget that will save the American taxpayer nearly $10.5 billion by the end of FY 1983 compared to what the previous Administration intended during the same period. As President Reagan said in his State of the Union message, reducing Federal spending is one of four "common sense fundamentals" of our Economic Recovery Program.

We ask this Committee to weigh our budget proposal in the same spirit and with the same constructive purpose as was evidenced last year. Through an open dialogue, we hope to show that this budget represents a realistic approach to building a sound knowledge base from which the fossil energy industry can select, further develop, and commercialize the technological options it deems most appropriate to meet our energy needs most efficiently.

Mr. Yates. You have a rather comprehensive statement, tell us how well your Agency is doing.

Mr. Mares. I think the Agency is doing very well, Mr. Chairman.

Mr. Yates. All right, do you want to expand upon that conclusion?

Mr. Mares. Well, we have, in fossil energy, been redirecting the program from demonstration projects towards long-range, high-risk research and applied research and some proof of concept, and I think we are making good progress in that regard.

To expand even further, what we might propose doing would be to take the short version of my detailed statement, and take some of the highlights from it, or just let you read it hurriedly, whichever you prefer. Then we would be happy to respond to your questions.

### DEFERRALS

Mr. Yates. Well, let's talk about your deferral, first, and about the programs that were part of the deferral message.

Mr. Mares. As you know, last Thursday the House rejected the deferral proposal that we had made for about $45 million. The statements and reports related to the disapproval requested a reprogramming request for approximately $20 million of the proposed amount of deferral. We do expect to submit such a reprogramming request very soon that would be consistent with the original deferral request and the judgment of Congress regarding it.

### EXXON WITHDRAWAL FROM OIL SHALE PROJECT

Mr. Yates. Let's have your comments on the decision of Exxon to pull out of the oil shale project. How does that affect what you are doing?

Mr. Mares. Well, the work in our office is research and development, so our time horizon is far beyond the time horizon of Exxon as it relates to that project. We are of course disappointed when any opportunity to diversify our domestic energy supplies is diminished, and I think that the judgment by Exxon regarding that project does have an impact on the timing and pace of an emerging oil shale industry. I think that we cannot advocate on the one hand that energy decisions be based on market signals without also recognizing that those that are in the market and evaluating the market may conclude to postpone, delay or even cancel large investments where they judge that the marketplace is not quite ready for them.

I think that in our view, markets will eventually stimulate the development of synthetic technologies including oil shale, and in time, ventures such as the Colony Project will become economically viable. In our budget for 1983, and in the future, we are supporting research in oil shale, some dealing with environmental aspects, as well as the in situ fragmentation work. It should be noted that the In situ processes are different than the surface processes which were being contemplated in the Colony Project as well as in the continuing Union Oil Project.

## HEAT ENGINES PROGRAM

Mr. **Yates**. Your statement says that, "We are in a transition period. We have proposed to eliminate some activities entirely rather than disburse small amounts of funding across too broad a technological spectrum."

What is the heat engines program? You say where we believe industry is well postioned to evolve many of the technology improvements from activities it has already underway. Higher temperature turbines, for example. Are you talking about the turbine automobile engine program?

Mr. **Mares**. No, sir. This is the gas turbine that is used in combined cycle projects. What we are thinking of explicitly is the Coal Gasification Combined Cycle Project in California where coal is gasified and then goes into a gas turbine and is combusted. Inlet temperature of the gas turbine is about 1,900 degrees F. There is research that has been funded by EPRI for several years in private sector firms which is looking at 2,300 to 2,400 degrees F inlet temperature.

We have been funding this type of technology development for several years and have tested individual blades and buckets that could be used in two cooling concepts. One is an air cooling concept, and the other a water cooling concept at 2,600 degrees F.

The impact of the technology development would increase the overall efficiency of the gas turbine. We believe that we have carried this technology to the stage where the next step can be carried on by the private sector. It will be evolutionary development from the 1,800 to 1,900 degrees F level which we see in the Coolwater project which is going forward.

## MAGNETOHYDRODYNAMICS (MHD)

Mr. **Yates**. All right. You say another is magnetohydrodynamics. You say there the issue is not whether the technology is of marginally greater benefit. Simply it is a process requiring large-scale extensive proof of concept effort.

Certainly, this is not a technique that industry is ready to adopt, is it?

Mr. **Mares**. That is correct. Our judgment is that the next major stage of development is a proof of concept facility which would be approximately 200 megawatts that would cost about $350 million. The developmental costs to get the Nation to a stage where we would be prepared to embark upon that is probably another $150 million. It would take us about 4 years probably before we had enough of a technology base to decide to proceed. It would probably take 6 years to design and build it, probably another 2 to 3 years to operate it.

So, our view is that it is too great an expenditure of money for proof of concept of a technology in comparison to other technologies that the Federal Government is funding aimed at making electricity in a more environmentally acceptable and economically attractive manner. The costs of the MHD project are too large, when one considers that these expenditures could potentially be available for other projects such as pressurized fluidized bed, as well as fuel cells.

Mr. **Yates**. How much money has been invested in this program so far?

Mr. **Mares**. About $400 million has been invested already; $420 million to be more accurate, including about $150 million in two test facilities, one in Butte, one in Tullahoma, Tennessee. There is no question the Nation has already invested a large amount of money, but to carry MHD through the next step, the engineering test facility, would require more than we have already invested. Let me provide for the record a more detailed funding history of the MHD program if I may?

Mr. **Yates**. The detailed statement may be made a part of the record.

[The information follows:]

### MHD SYSTEMS DEVELOPMENT: A HISTORICAL BUDGET SUMMARY

Since fiscal year 1971, approximately $420 million has been appropriated for MHD systems development. However, the total funding during the period that the MHD program resided within the Office of Coal Research (1971-1975) amounted to about only $25 million. The major MHD development activities were not initiated until the 1975/1976 time period, with the formation of the Energy Research and Development Administration. The approximate specific funding by fiscal year was as follows:

| Fiscal year: | *Millions* |
|---|---|
| 1971 | $0.6 |
| 1972 | 1.0 |
| 1973 | 3.5 |
| 1974 | 7.5 |
| 1975 | 14.3 |
| 1976 | 37.3 |
| 1977 | 40.0 |
| 1978 | 71.5 |
| 1979 | 77.0 |
| 1980 | 79.0 |
| 1981 | 61.0 |
| 1982 | 27.8 |

The funding summary by specific technical program elements is approximately the following:

| | | |
|---|---|---|
| I. | Facility construction and activation (including test articles): | |
| | A. CDIF (activated Feb. 10, 1982) | $108 |
| | B. CFFF (activated Dec. 8, 1981) | 46 |
| II. | Component development in support of CDIF/CFFF engineering qualification tests: | |
| | A. Coal combustor development | 25 |
| | B. MHD channel development (including AEDC facility construction). | 60 |
| | C. Superconducting magnet development | 35 |
| | D. HRSR (steam bottoming cycle, seed recovery, and emission control). | 20 |
| III. | MHD plant design and analytical modeling | 20 |
| IV. | Supporting research | 50 |
| V. | Closed cycle MHD research | 10 |
| VI. | US/USSR program | 20 |
| VII. | Field management and general support | 26 |
| | Grand total | 420 |

Mr. **Yates**. You don't think the additional investment would be cost effective?

Mr. **Mares**. Compared to the fact that we do have other methods, other technologies that we are funding that would make electricity for us in an environmentally acceptable fashion and, considering we are trying to make very hard choices about how we spend limited Federal research dollars, I think that it is more cost effective to put money into other technologies than to try to with a large proof of concept facility.

Mr. **Yates**. Was your previous answer based on what your estimate would be to bring MHD to a development status, or is that to commercialize?

Mr. **Mares**. No, the $500 million is what would be required roughly to go through proof of concept, not a full commercial scale unit. This would be a 200 megawatt unit, that is, it would be at a scale from which data would be provided so that the private sector could make decisions as to whether or not they wanted to go ahead and commercialize the technology.

Mr. **Yates**. Is this conclusion of yours based on limitation of funds, or on the lack of promise that the technology has shown up to the present time?

Mr. **Mares**. So far, the technology has been achieving the technical milestones that were set for it to achieve. However, we have not yet proven the concept of MHD at a scale that comes anywhere close to what the commercial scale would be. In order to do that we believe that you would have to have a large proof of concept facility that would be at about 200 megawatts electric, and costs approximately $350 million.

When we add that $350 million plus the technical work required to get us to that stage, for a total bill of around $500 million, and look at it in the context of a fossil energy program of about $100 million a year, our judgment is that is not an appropriate expenditure of national funds. There are other technologies that we are working on, even at the proof of concept level, that offer enhanced efficiency in the production of electricity in a more desirable environmental way.

### ALTERNATIVES TO MHD PROJECT

Explicitly, we are thinking of the fuel cell area and the pressurized fluidized bed area. There is also commercial work underway in the atmospheric fluidized bed area that is already being used in some industrial applications. TVA is also looking at AFB technology in a test operation as a means for electricity generation that appears to have the potential to be more economically and environmentally attractive than alternatives currently available to us.

Mr. **Yates**. Which technologies? Is fuel cells one of them?

Mr. **Mares**. Yes, sir.

Mr. **Yates**. In last year's justification the statement is made: A major U.S. investment has been made in the MHD program—a third of a billion dollars. The program is currently at the point of initiating the critical component and subsystem tests which will confirm the engineering feasibility of the MHD power plants and provide the basis for further decisions by the private sector regarding commercial scaling. That is no longer true?

Mr. **Mares**. The components are being tested at the Butte facility, and some at the Tullahoma facility. I think even a year ago the expectation was that there would be a large proof of concept facility that would be required before the process would be considered to be commercially proven, or a process that would be ready for commercial application.

### TOTAL FOSSIL ENERGY FUNDING LEVELS

Mr. YATES. What happened to Mr. Legassie?

Mr. MARES. Mr. Legassie retired.

Mr. YATES. He was the one who was answering the questions last year.

All right. It is kind of interesting to look at your budget. In fiscal year 1982 you had a budget of $416,872,000. In fiscal year 1983 you request a budget of $106,900,000, which means a reduction of almost $310 million. That would seem to indicate that you are not very much interested in research and development any more, is that right.

Mr. MARES. No, sir, I do not think that that is necessarily the judgment that should be reached. I think that is the reflection of looking at the totality, not only of Fossil Energy in the Energy Department, but of all the Departments in Government and trying to reach a judgment as to what is the appropriate balance of expenditure on very worthwhile potential claimants for funds. When we balance it all, the judgment is that the private sector is very active in fossil energy R&D. Also, I think you would be well aware of the fact that over half our expenditures are in fact with private sector firms, that there is the likelihood and the probability that substantial R&D will be conducted by the private sector in the area of fossil energy and that the Federal Government is not the only source of funding for basic and applied research in the fossil energy area.

### BUDGET REQUEST OF OMB

Mr. YATES. Were you part of this budget preparation?

Mr. MARES. Yes, sir.

Mr. YATES. For this fiscal year?

Mr. MARES. Yes, sir.

Mr. YATES. Apparently you had responsibility for taking this budget through the Department and through OMB?

Mr. MARES. Yes, sir, from August, onward.

Mr. YATES. You asked OMB for $305 million.

Mr. MARES. Yes, sir.

Mr. YATES. OMB cut you back by $200 million.

Mr. MARES. No, sir, the Administration made the judgment that the appropriate level of budget for fossil energy for fiscal year 1983 was $106.9 million.

Mr. YATES. That is right. But you had asked the Office of Management and Budget for $305,170. OMB had approved $106,900.

Mr. MARES. Where we are differing, sir, is not as to what we requested, but the responsibility for the final number. I suggest to you, sir, that it is the total Administration that is making this request, it is not a separate agency within the Government. It is based upon a review——

Mr. YATES. You mean OMB did not make the judgment?

Mr. MARES. I would say the judgment is the totality of the Administration, sir. OMB obviously influences the judgment as well as the Department of Energy. The budget as it is finally submitted is the budget signed by the President of the United States.

Mr. **Yates**. Who else participated in this judgement besides OMB?

Mr. **Mares**. My understanding is that it was reviewed by the senior management officials of the United States including the President of the United States.

Mr. **Yates**. You mean the President of the United States made the decision to cut you back $200 million?

Mr. **Mares**. The President of the United States made a decision as to what the level of budget would be for the various Departments, and many of the individual issues were decided by the President. I was not present at such a review. What I am suggesting is that the Administration did submit a total budget, that is an Administration budget wherein the judgment was that the level of funding for the Department of Energy Fossil Energy Office should be approximately $100 million.

Mr. **Yates**. Did you appeal the number to the President of the United States?

Mr. **Mares**. Yes, sir, the Department of Energy did appeal that number.

Mr. **Yates**. And you were turned back?

Mr. **Mares**. Yes, sir.

Mr. **Yates**. Your appeal was rejected?

Mr. **Mares**. The appeal was not accepted. Dismissed.

Mr. **Yates**. Okay. What is in the $200 million that the President of the United States took away from you?

Mr. **Mares**. Well, the details of it are encompassed in the—I believe you have them there—the so-called Hollifield tables which do describe what was in the proposed $305 million budget.

Mr. **Yates**. Why the Hollifield tables rather than the Smedley tables?

Mr. **Mares**. I think it is referring to a former colleague of yours here in Congress.

Mr. **Yates**. He has not been here for years.

Mr. **Mares**. Well, his name lives on.

Mr. **Yates**. Hollifield table; first time I have heard it referred to as that.

### SECRETARY'S APPEAL TO OMB

It is kind of interesting to read the letter Secretary Edwards wrote to Mr. Stockman, isn't it? I think we will put the whole letter into the record at this point.

[The letter follows:]

[From the Energy Daily, Dec. 9, 1981]

**Dear Mr. Stockman:**

Throughout the passback material, the rationale for severe manpower and many dollar level cuts was that the dismantlement of the Department of Energy would be completed by the end of fiscal year 1982. While I am carrying out the President's mandate to dismantle the Department as rapidly and efficiently as possible and have held a number of discussions with the President's immediate staff to narrow down and select the most appropriate plan for carrying out the dismantlement, I am convinced that the dismantlement process will extend into fiscal year 1983. This process must be orderly and carefully orchestrated so that budgets and organizational plans proceed in tandem, and to assure that we observe the laws and regulations governing employees impacted by such substantive organization changes.

We are finalizing a dismantlement plan which will facilitate this process and permit identification of any necessary revisions to the fiscal year 1983 budget. To move ahead with a fiscal year 1983 budget based on current OMB assumptions could undermine the President's overall objectives. Our credibility with the public will be lost if we suggest that we do not have a commonly agreed upon foundation for our activities. Ther are many indications that dismantlement legislation will be controversial and could be debated for a long time before final action is taken in the Congress; therefore, the character and timing of ultimate legislation is uncertain.

Furthermore, thousands of adverse personnel actions would have to be initated by June, 1982 (at the same time dismantlement legislation is being considered) in order to achieve the year-end reductions necessitated by your passback.

I believe the circumstances outlined above argue for approaching the fiscal year 1983 energy budget in a different context—that the Department will be in existence at least at the beginning of fiscal year 1983 and therefore would require essentially the same organization and management structure as today, although it may be reduced substantially in funding and manpower from fiscal year 1982. In any event, I feel strongly that the manpower levels must be related to the programmatic budget levels as long as the Department is intact. Our revised fiscal year 1983 budget request transmitted by this letter is based on this assumption.

In addition to the points stated above, I believe this concept will also facilitate achievement of the following objectives:

Ensuring orderly dismantlement and transition of programs and responses as a function of the OMB Determination Order process.

Maintaining stability and continuity of important ongoing programs.

Ensuring protection of DOE employee rights to compete for employment in successor organizations under terms of "transfer of function" regulations.

Realizing savings of 4,400 Federal positions in energy programs in fiscal year 1984, in keeping with the President's goal of reducing 75,000 positions overall.

The following table summarizes the amounts proposed by OMB and appealed by the Department for each of our three major program areas—Defense, Energy, and Strategic Petroleum Reserve.

As indicated by the table, before the adjustment to take the Strategic Petroleum Reserve (SPRO) oil acquisition funds off budget, the allowance made reductions of $1.5 billion and an addition of $1.4 billion to the Department's request. Against the reductions of $1.5 billion, the Department is requesting restoration of $0.9 billion.

Before I discuss the specifics of these appeals. I would like to review the process by which the Department's initial request of $11.6 billion was developed. This process demonstrates our commitment to the President's program.

BUDGET AUTHORITY

[In millions of dollars]

| | Request | Allowance | Difference | Amount appealed | Revised request |
|---|---|---|---|---|---|
| Defense programs | 5,604 | 5,304 | −300 | +279 | 5,583 |
| Energy | 4,609 | 3,760 | −849 | +641 | 4,401 |
| Strategic petroleum reserve: | | | | | |
| Facilities and planning | 604 | 242 | −362 | 0 | 242 |
| Oil acquisition | 796 | 2,225 | +1,430 | 0 | 2,225 |
| Subtotal | 11,613 | 11,531 | −82 | +920 | 12,451 |
| Less: SPRO off budget | | −2,225 | −2,225 | | 2,225 |
| DOE total | 11,613 | 9,306 | 2,307 | +920 | 10,226 |

On March 24, 1981 we received your guidance memorandum which provided target levels for the Department for budget authority and outlays for fiscal years 1983-86. The budget authority provided by this memorandum totaled $14 billion for fiscal year 1983. Recognizing that we would need to be at, or below, this level to support the President's Economic Recovery Program, the Department worked during the summer months to develop a balanced budget for each of the three major program areas while remaining within the $14 billion dollar target provided by your memorandum. To achieve this objective while recognizing the expanding requirements in the Defense Program area required to support the Nuclear Weapons Stockpile Memorandum, we had to make some difficult decisions and initiate some significant redirection of programs supported in the fiscal year 1982 revised budget, particularly in the energy area. In total, reductions of $3.3 billion were made during our internal review process to remain within the target level.

Immediately after our budget was submitted on September 15, 1981, you and I had some discussions about additional reductions necessary if we were to be successful in our common efforts to bring interest rates down and stimulate the economy. As a result of these discussions, I initiated a Department-wide effort to achieve additional budgetary reductions totalling $2 billion. On September 25, I held final reviews with my Assistant Secretaries on reduction alternatives. That same day, we received your guidance memorandum directing an additional $1 billion cut, bringing your request to a $3 billion reduction in outlays below our September 15 request level.

As you know, we were able to achieve this additional reduction which amounted to more than a 20 percent decrease in our total budget and to meet your deadline of October 5 for submission of a revised budget request. The program cuts required to achieve an $11 billion budget were not made without impact. Again our objective was to develop a budget which supported the vital energy and economic goals of this Administration. In this effort each program was carefully reviewed and structured to maximize achievement of our program goals within the new, very stringent fiscal restraints. I am proud of my staff for the yeoman service they performed in such a short period of time. While we would have liked to expand certain programs, such as filling the Strategic Petroleum Reserve above the mimimum level shown in the revised budget, we could not do so without necessitating unacceptable reductions in other defense and energy programs.

With this as background, I would like to discuss our appeal to your allowance decisions. As indicated in the summary table, you have imposed reductions of $1.5 billion below funding levels we requested. In a continued effort to support the President's objectives we can accept $0.6 billion of these reductions; however, we cannot conduct the kind of defense and energy programs which support the Presdent's objectives without some funding and manpower restoral.

## DEFENSE

In the defense programs area we are requesting restoral of $279 million of the $300 million marked. The main issue here is the deletion of all funds requested for the Defense Waste Processing Facility at Savannah River and of $98 million of funds requested for the Waste Isolation Pilot Plant at Carlsbad, New Mexico. I feel very strongly that increases in the production of nuclear weapons in support of the Nuclear Weapons Stockpile Memorandum requires that we develop a permanent solution to the problem of disposal of high level nuclear waste. Contrary to the arguments in the passback material, there is a conceptual design for the Defense Waste Processing Facility and Title I design efforts are now underway. Borosilicate glass has been the reference waste form for design purposes for two years. Alternative waste forms are being evaluated but R & D to date confirms borosilicate glass as the best overall candidate for defense waste. The scope of the Waste Isolation Pilot Plant does not go beyond that approved by Congress. In fact, that scope is required to demonstrate the safe disposal of radioactive wastes resulting from Defense Activities (Section 213, Public Law 96-164). The $98 million is essential to continue work on this R & D facility, and to demonstrate the nation's resolve to permanently dispose of nuclear waste generated in support of our weapons program.

## ENERGY

I am transmitting to you appeals for a total of $.6 billion for our energy programs. There are several areas of major concern including severe cuts in the nuclear and fossil program areas and the change in policy proposed for fossil, solar, conservation and geothermal programs. The policy change would redefine the Federal role in support of non-nuclear energy technologies and would require some significant revisions to the policies this Administration has supported before the Congress and the public. The proposed revisions would limit Federal involvement to only the most basic, generic kinds of research, would eliminate environmental work which is essential to achieving feasibility of new technologies, and would discontinue work necessary to complete proof-of-concept activities which are essential if activities are to be turned over and accepted by private industry. In addition, the policy on discontinuation of demonstration activities would serve to terminate the operation of facilities with significant such costs from which we are just now beginning to obtain data, such as the Barstow Central Receiver Plant, while, if literally interpreted, would argue for continuation of activities which this Administration has proposed for termination such as SRC-1, H-Coal and the Donor Solvent Project. I want these proposed policy changes reconsidered so that we can stick to our objective of funding only long-term, high-risk but potentially high pay-off research and development through the proof-of-concept stage.

Let me now address specific appeals in each of the energy program areas.

## NUCLEAR ENERGY

Your proposed nuclear energy budget would not permit me to fulfill the President's commitment to the restoration of the nuclear industry. The appeal in the nuclear energy program area is for restoration of $203 million of the $344 million proposed for deletion. There are serious problems with both the proposals to establish private sector financing for the terminal isolation program and with the proposal to terminate work in the Large Development Plant (LDP) within the Liquid Metal Fast Breeder Reactor program. A revolving fund for the Terminal Isolation program would require legislation and an establishment period to becoming operational. The utility companies would need approval of rate increases and time to accumulate the capital needed to invest in such a fund. These actions cannot be accomplished within the ten months remaining prior to the beginning of fiscal year 1983. In the meantime, work on site characterization, construction of exploratory shafts and design of the test and evaluation facility must proceed if we are to meet the 1989 completion date to which we are committed. Restoral of $110 million is essential to prevent substantial disruption to the program.

The discontinuation of the Large Development Plant will effectively prevent the building of any breeder plant beyond the Clinch River Breeder Reactor (CRBR). If we are to achieve the goal of private sector commercialization of the breeder, we must support continuation of the LDP program. I am also requesting restoral of funds for continuation of research and development work at Barnwell, for plutonium conversion, for waste treatment and for light water reactor safety. These funds are essential to preserve our options for obtaining plutonium from civilian reprocessing plants, to continue work on a safer, easier plutonium conversion process, to support establishment of regional, commercial low-level waste burial grounds, and to permit minimal activities in response to the President's directive to restore the health of the light water reactor industry.

## URANIUM ENRICHMENT

In the uranium enrichment program I am concerned about the proposal to require the Department of Defense to reimburse DOE for enrichment activities in support of the Naval Nuclear Propulsion Program. The $109 million which was deleted from the DOE budget is essential to ensure production of enriched uranium required to support the construction of shipboard and shoe-based naval reactors. I have no objection to the transfer of this funding to DOD and establishment of a reimbursable agreement between our Departments. However, I understand that no funds were provided to DOD to fund this support. Funding must be provided in either the DOD or DOE budget to ensure continuation of these essential enrichment services.

In addition, I am requesting restoration of funding for Advanced Isotope Separation to correctly price the program anticipated in your passback and restoration of $5 million to permit an orderly close out of the Uranium Resources Assessment program.

## FOSSIL ENERGY

This nation and the world will be employing fossil fuels as the dominant source of energy for decades to come. Technological base advances are needed to sustain this usage, to make such usage more economically efficient, to support a continuing shift to new forms and sources of these fuels, and to address growing environmental concerns.

In addition, a previously unidentified requirement exists for $2.4 million to support DOE management of the Great Plains gasification project. No funds were included in the budget for this support in accordance with the Administration's position that this effort would transfer to the Synthetic Fuels Corporation. It is now apparent that this transfer will not take place. This requirement can be accommodated within the $305 million request for fossil energy as a result of offsets from manpower savings.

Mr. **Yates**. I will read a couple passages from it.

> Dear Mr. Stockman: Throughout the passback material, the rationale for severe manpower and many dollar level cuts was that the dismantlement of the Department of Energy would be completed by the end of fiscal year 1982. While I am carrying out the President's mandate to dismantle the Department as rapidly and efficiently as possible and have held a number of discussions with the President's immediate staff to narrow down and select the most appropriate plan for carrying out the dismantlement, I am convinced the dismantlement process will extend into fiscal year 1983. The process must be orderly and carefully orchestrated so that budgets and organizational plans proceed in tandem, and to assure that we observe the laws and regulations governing employees impacted by such substantive organization changes.

Then in the field of fossil energy Mr. Edwards says:

> I am requesting restoral of the entire $198 million deleted from the Fossil Energy Program. This is a bare minimum we can accept.

Pretty strong statement, isn't it?

> A viable, effective, sustainable fossil energy program is a key element of a balanced overall energy R&D effort. The proposed reduction in this area which is tantamount to elimination of the activity is unacceptable.

Very strong statement, right?

Mr. **Mares**. Yes, sir. What was the date of the letter as reported?

Mr. **Yates**. This is as it appears in the Energy Daily of Wednesday, December 9, 1981. Is there any question that it is a correct letter? Do you have a copy of the letter?

Mr. **Mares**. No, sir, I read what purports to be such a letter in that journal.

Mr. **Yates**. You didn't prepare it?

Mr. **Mares**. I made some suggestion to the Secretary which——

Mr. **Yates**. Is this language I just read yours?

Mr. **Mares**. I don't believe that is literally my language, no, sir.

Mr. **Yates**. It doesn't sound like the Secretary's language. Who in your Department prepared it?

Mr. **Mares**. Well, as you undoubtedly know, letters that are prepared within a Department are the result of many cooks. But I would——

Mr. **Yates**. I want to know if you used the words "Is unacceptable." That is a very, very strong statement. OMB said you will accept it; they refused your language. "It is unacceptable" was the language the Department of Energy used.

Mr. **Mares**. The Department.

Mr. **Yates**. And OMB said, "Nuts to you, Buster."

Mr. **Mares**. Again I am curious as to the date of the letter. It doesn't say.

Mr. **Yates**. Yes, it says here, a November 24th letter from Energy Secretary James Edwards. Why, is there a subsequent letter to this?

Mr. **Mares**. Not to my knowledge.

Mr. **Yates**. No, there isn't. This is the letter. Why are you curious as to the date?

Mr. **Mares**. Well, I think that the date is fairly significant, because what you are reading there is a very normal process in the development of a budget in any organization, where a senior official responsible for a budget is reviewing with his or her superior what in his mind are the consequences of the proposed action.

Mr. YATES. Right.

Mr. MARES. And there is dialogue that subsequently takes place. Furthermore, the budget officers almost always——

Mr. YATES. There is dialogue to this that takes place?

Mr. MARES. There is dialogue——

Mr. YATES. To this letter?

Mr. MARES. Took place involving the Department and the Secretary and senior officials of the Administration before the budget was submitted to Congress on February 8. That was a November dialogue. Or November submission. It is quite frequent that the budget officer submitting to his or her superior, a request for additional consideration does not him or herself know what are the total financial situations that is confronting the superior budget officer. So, it is not at all surprising to me that an individual appealing a particular budget would make strong statements to ask for reconsideration. The same thing is happening today with firms that come and suggest that unless we continue to fund their activities, they won't do anything about continuing. Until they are finally put to the test, you don't know for sure whether they are going to continue to fund an activity or not.

Mr. YATES. Well, I am impressed with the fact that in the first part of this letter the Secretary is telling the President, through Mr. Stockman, who happens to be the President's representative on the budget, that he is carrying out the President's mandate to dismantle the Department as rapidly and as efficiently as possible. And in another part of the letter he says that the amount of money that is deleted, knowing that the Department is being dismantled, is unacceptable. That to my mind adds great strength to the latter paragraph, because it means that having very much in mind the fact that we aren't going to be alive much longer, you have got to keep at least this minimum amount in effect for research and development. And the only impression I can draw from this is that whoever made the decision to overrule your boss I think was acting irresponsibly, even having in mind the whole budget picture, because the energy situation of this country is far from perfect.

Mr. MARES. Well, I think we all agree with that. I think we all agree that there should be Federal funding of some research and development in the fossil energy area.

Mr. YATES. Why do we go through the charade, then, of asking for $106 million? Is that to liquidate the program?

Mr. MARES. No, sir, that is not to liquidate the program. That is the level of funding that the Administration, we, believe is the appropriate balanced level when you look at all of the demands for research and for Federal expenditure. We weighed all the things under a very difficult economic scenario. Within that hundred, that is all the program we expect to be able to conduct in fiscal year 1983. The deferral proposal that we had submitted contemplated deferral of about $45 million which would have been used to restructure and transition from 1982 into 1983, and to cover the costs of consolidation, terminations, particularly as it relates to some of our ETC's. So, we did not expect to have to spend the programmatic funds that we are requesting, namely $106.9 million for 1983 in fiscal year 1983 on such termination expenditures. The fact that the deferral was overturned is going to make it more difficult for us, and we are going to have to be a bit more creative in figuring out how to have the 1983 budget, in fact, present and provide a program for the Nation consistent with what we are proposing.

Mr. **Yates**. I am not sure I understand that. But tell me about your 1984 budget. What are you going to do in the Department in 1984?

Mr. **Mares**. Well, we have not come up with a 1984 budget as yet.

Mr. **Yates**. Aren't you supposed to be preparing one?

Mr. **Mares**. I do not know when the formal request deliverable is to the OMB and Administrative Office of the President. But I imagine it will be due in late summer or early September.

Mr. **Yates**. I think that is true. What is proposed for 1984? Will you be closed down?

Mr. **Mares**. My expectation is that there will be a fossil energy budget in 1984. The exact level I——

### TRANSFER TO DEPARTMENT OF COMMERCE

Mr. **Yates**. In which Department?

Mr. **Mares**. Well, I think that there will be a budget, wherever we are located. We do expect that legislation will be submitted to the Congress within a matter of a week or so under which the Office of Fossil Energy, along with other offices would be transferred to the Department of Commerce as part of the Energy Research and Technology Administration.

Mr. **Yates**. Why is that better? Why is it better to move this out of your shop into the Department of Commerce?

Mr. **Mares**. Well, the Office of Fossil Energy would stay as a whole and be transferred along with the Office of Energy Research, Nuclear Energy, Conservation & Renewable, Defense Programs.

In fact, the research corps of the Department would be transferred as an entity into the Energy Research and Technology Administration.

Mr. **Yates**. Why is that better, moving all those over? Why wouldn't it have been better to consolidate all those programs in the Department of Energy? Why bury it in a Department whose main function is not the advancement and fostering of the energy development of this country?

Mr. **Mares**. I think that goes back to one's judgment about the necessity of having a Cabinet Department known as the Department of Energy, and whether in one's judgment it is necessary or desirable for the balance of all of the governmental needs and activities.

The Administration's judgment is it is not necessary or productive for there to be a separate Department of Energy. We are going to be submitting legislation to the Congress. The Congress obviously has to decide whether or not it agrees with the Administration.

Mr. **Yates**. What happens if the Congress does not agree with the Administration?

Mr. **Mares**. Then the Department of Energy will continue until such time as Congress were to be persuaded that it was desirable to transfer the Department of Energy into some other institutional framework.

Mr. **Yates**. It will continue as a skeletal structure, right?

Mr. **Mares**. I would not say as a skeletal structure. The level of research in fossil energy is less than it has been in the past. I think that our view is that the research that the Federal Government ought to fund is that which the private sector will not fund.

### PRIVATE SECTOR WITHDRAWAL FROM ENERGY PROJECTS

Mr. **Yates**. What are you going to do in oil shale, now that Exxon has pulled out? I notice, too, in the Energy Daily that Occidental Petroleum's Research Division is going to end its program to develop technology to convert coal to liquid products. Private industry is pulling out of a number of projects that at least the earlier Department of Energy considered to be important.

You have just indicated that if private companies do not do it, perhaps the Government should. So, should the Government be moving into these areas?

Mr. **Mares**. We are funding efforts in 1983 in oil shale, about $6.3 million, split between environmental research or environmentally motivated research, as well as some process research on in situ processing of shale.

That research is oriented towards rock fragmentation, with the expectation and hope that by developing in situ shale processes, they will be more environmentally acceptable than the surface processes, which is the type of process being used by the Colony project and the Union project.

Mr. **Yates**. Well, for the oil shale technology base, your justification indicates in 1981 you had an appropriation of $30,251,000. In 1982 that was cut to $16,176,000. In 1983 that is cut to $3.7 million——

Mr. **Mares**. $6.3 I believe. Beg your pardon, as opposed to environmental.

Mr. **Yates**. So we are pulling out of oil shale technology, are we not?

Mr. **Mares**. I would say we are reducing it, not pulling out of it.

Mr. **Yates**. I assume you would have given me the same answer on the——

Mr. **Mares**. A little harder to justify than $3.7 million.

Mr. **Yates**. I think it is a little hard to justify $3.7 million, too.

Anyway, what are you going to do in the field of synthetic fuels? Tosco is joining Exxon in pulling out of oil shale. Occidental Research is pulling out of conversion of coal into liquid.

Mr. **Mares**. I think that we in our Department are continuing to fund basic research, applied research in the synthetic fuels technologies. Oil shale, coal liquefaction, coal gasification specifically.

Mr. **Yates**. These are all expensive projects and processes, are they not?

Mr. **Mares**. At a commercial level or a large pilot plant, yes, sir, they are.

## SCALE OF PROJECTS

Mr. Yates. Well, how much research can you do with $106 million? There is not much you can do with that, is there?

Mr. Mares. No, sir, I disagree with that. I think that you can do some very intelligent work with $106 million. The sort of knowledge that you do not obtain on a budget level of $106 million is the knowledge that relates to scaling factors in terms of commercial scale. Collecting data from a 250 ton a day plant such as the EDS coal liquefaction plant, or the 200 or 600 ton a day plant of the H-Coal plant, that kind of scale is not doable in a budget of $106 million.

That is the scale from which, then, a commercial plant could be intelligently sized. The private sector has currently in development the pilot plants in other processes that are required from which they can decide whether or not to proceed with a commercial plant.

## NONFEDERALLY SUPPORTED FOSSIL PILOT PROJECTS

Mr. Yates. Can you give the committee some examples of fossil-related pilot plants that cost over $20 million that are proceeding without Federal support?

Mr. Mares. Oh, yes. The Exxon catalytic gasification project in Holland is about a $500 million project that has no Federal support in it.

Mr. Yates. Is that a cost-sharing project?

Mr. Mares. No, sir.

Mr. Yates. Purely by Exxon in Holland?

Mr. Mares. Yes, sir.

Mr. Yates. No partners?

Mr. Mares. I do not think they have any partners in it. I know they do not have the Federal Government in it.

Mr. Yates. What about the one in England?

Mr. Mares. Grimethorpe?

Mr. Yates. Yes.

Mr. Mares. The one in Scotland might have been a better one, the Westfield test which is now 6 or 7 years old. I do not think there was U.S. Government money in it. I think that was all private.

Mr. Yates. I think there was at the start.

[Committee note.—Subsequent to the hearing, the committee was informed that the test was supported by the Department of Energy as part of the high-Btu Demonstration Plant Program.]

Mr. Mares. But the Grimethorpe project for sure has United States, Germany and United Kingdom Government funds in it, governmental expenditures.

Mr. Yates. Is there any level of certainty of success that the private sector looks at before undertaking development of a pilot plant?

Mr. Mares. I think that decision varies from technology to technology, from potential demand for the product or technology, whether a particular technology might come to commercial fruition. I do not think there is a hard and fast rule on that.

To reflect back on the earlier question, there are two projects that are going forward that are really larger than pilot plant size,

..ıere is so far no Federal Government involvement. One is the Coolwater project which I referred to earlier which is in southern California, a coal gasification combustion turbine combined cycle project, and the other is the Tennessee Eastman synfuels project going forward in I think Kingsport, Tennessee.

### GRIMETHORPE

Mr. YATES. Are you going to stay in Grimethorpe, is the American Government going to stay in the experiment at Grimethorpe with Great Britain and West Germany?

Mr. MARES. Yes, sir, we have requested $2.5 million that we believe is the amount which will be needed—excuse me. I just got a briefing on it. In fact, there was a negotiating session last week in England regarding that project. Our judgment is that we will be able to successfully complete the critical work that was expected to be done in that project with the $2.5 million that we are requesting in fiscal year 1983.

We contemplate that our fiscal year 1983 budget request would complete our commitment to that project. We intend to negotiate with the other partners, the UK and the Federal Republic of Germany, on a final test program that would result in an expenditure by the United States of only—I do not mean to say it is small, it is a lot of money, any amount of money we spend is a lot of money, but that would involve the expenditure of $2.5 million instead of larger numbers which had been contemplated earlier.

Mr. YATES. How much are Germany and England putting in? $2.5 million each? Is each of the countries making the same contribution?

Mr. MARES. So far, each country has contributed equally, a third, a third, a third.

Mr. YATES. So far, you say. Is there any change in the offering?

Mr. MARES. I do not know what transpired on that issue last week, but up through the discussions last week there was no change contemplated.

### GRIMETHORPE COMPARED TO CURTISS WRIGHT PLANT

Mr. YATES. What is the rationale for continuing to subscribe to the work on the Grimethorpe plant, and closing down the Woodridge plant?

Mr. MARES. The Woodridge plant is not completed. It is about 70 percent completed. The plant in Grimethorpe is completed, has operated, and involves two other nations. We believe we can complete our international obligation as well as get the critical information on the key element of the PFB combustor by completing that project, and demonstrating this process at the proof of concept level.

Thus, our judgment is that it is not necessary for us to continue to proceed to construct and then operate the Woodridge plant. We have at least $15 million worth of construction ahead of us and then an operating program. As of this moment, we do not have a cap on either the construction costs or on the Government participation for the operation of that plant.

So, the judgment was that when you have scarce resources, you complete and get the value out of a facility which is operating, and you do not continue another project.

Mr. Yates. Is our information correct, that the British and the Germans wanted to proceed more quickly with greater appropriations at Grimethorpe than we were, and that the reason for scaling back the activity there was the insistence of the United States?

Mr. Mares. I do not have a report from last week's session, but I think that we did cause the group to look more carefully at the final schedule and balance of work than had been done earlier.

Mr. Yates. I guess that means the answer to my question is, "Yes."

Mr. Mares. I think that if we were to ask them, I think that they would probably say that.

## U.S. FOSSIL BUDGET COMPARED TO OTHER NATIONS

Mr. Yates. How does the fossil budget for 1983 compare with the level of effort in this field of energy being expended by the Governments of Japan, West Germany and Britain?

Mr. Mares. I do not know what they plan to spend in fiscal year 1983.

Mr. Yates. Can you find out for the record?

Mr. Mares. Yes, sir, we will see what we can find out.

[The information follows:]

### Fossil Energy Research Funding for Germany, Great Britain, and Japan

Government research funding for the Federal Republic of Germany, Great Britain and Japan for 1980 and 1983 is shown in the table below.

[In millions of dollars]

| | Fiscal year | |
|---|---|---|
| | 1980 actual | 1983 estimate |
| Federal Republic of Germany | 158.1 | 255.0 |
| Great Britain | 71.0 | 110.0 |
| Japan | 170.8 | ([1]) |

[1] Planned funding not available at this time. However, the funding is expected to exceed fiscal year 1980 level.

## INTERNATIONAL PROJECTS

Mr. Yates. Has the Department of Energy been approached to participate in projects similar to the involvement in Great Britain and West Germany at Grimethorpe?

Mr. Mares. In any other projects, or in a specific project?

Mr. Yates. In any other projects.

Mr. Mares. Of a large nature, the only one that I can think of is the possibility of adding a turbine facility to the Grimethorpe——

Mr. Yates. To the same one.

Mr. Mares. To the same one.

I do not remember offhand a new-start large project being contemplated in fossil energy. There is a project that we have under way and that we are funding in 1983 in West Germany with Federal Republic of Germany funds. This project, the Mobil gasoline—methanol to gasoline process—uses the fluidized bed instead of a fixed bed which has already been demonstrated.

But I am not aware of a large proof of concept demonstration project as a new start being contemplated.

### PRIVATE INDUSTRY PARTICIPATION AT GRIMETHORPE

Mr. YATES. Have we sent out any invitations to private industry to participate in Grimethorpe?

Mr. MARES. On the alternate turbine test, if we have not already sent out requests to industry to determine their interest, we will be doing so. We have not, to my knowledge, sent out any request to invite private industry to participate in the operation of Grimethorpe subsequent to the completion of the tests currently contemplated.

Mr. YATES. The Germans and the British have sent out letters to their industries, have they not?

Mr. MARES. Regarding the alternate turbine, I believe that is so. I do not know if they had sent them out for the normal operation.

### COMBINED CYCLE PILOT PLANT

Mr. YATES. With respect to Woodridge, is that going to be closed down or is just the Federal Government participation being ended?

Mr. MARES. The issue on Woodridge is, as I have indicated, the appropriate level of funding for the completion of construction of this facility in fiscal year 1983.

Mr. YATES. I think what I am getting at is this: The committee has rejected the deferral on Woodridge.

Mr. MARES. Correct.

Mr. YATES. Have you negotiated with Curtiss Wright about keeping it open?

Mr. MARES. The issue is not really to keep it open. The issue is whether construction is completed or not.

We are more than prepared to talk to the Curtiss-Wright organization about how that project could be completed, realizing that we do not have any funds recommended for it in 1983, and realizing that as of this date, the last proposal given us put no limit on what the Government's exposure would be during the construction period, nor did it limit what our exposure would be during the operating period.

There were indications that some statement of interest or intent would be received from various entities to participate during the operating phase of the facility, which will cost about $6 to $8 million a year. There was some possibility that the Government expenditure would only be $1.5 million a year.

But, there is at least $15 million of construction required to complete the project. We do not have $15 million remaining in fiscal year 1982, and as of this moment there is no cap on the potential expenditure that the Government might have to complete this project.

So with those caveats, we are more than prepared to sit down and talk with the Curtiss-Wright Corporation.

## PLANNING AND POLICY

Mr. YATES. Why do you need $1 million for planning and policy when your 1983 program is only 10 percent of the level of the 1981 budget?

Mr. MARES. We have had money in that line item in the past. We had carried over some in 1982.

That funding seems to us to be an appropriate level, recognizing that we have got a $100 million program.

Mr. YATES. Is it for staff or contract studies?

Mr. MARES. There would be a mix of both.

Mr. YATES. In what proportion?

Mr. MARES. I have not decided that issue.

Mr. YATES. Okay.

Mr. MARES. We have generally been reducing substantially the amount of support service contractors, both the number of contractors and the man years of contract services that we have been employing over the last 6 to 8 months.

Mr. YATES. Do you propose any data collection within the $1 million request?

Mr. MARES. Data collection of what?

Mr. YATES. Of anything?

Mr. MARES. Only for such information where we may need to provide required analysis.

Mr. YATES. On page 33, you say the results of these studies and data collection will be input into the information for the out years.

That is why I ask, What data collection?

Mr. MARES. Such as is needed to do the analysis.

Mr. YATES. What kind?

Mr. MARES. Well, I don't, as of this point, know exactly what studies we will make or what data we will need to go ahead with it, to do it.

## ENERGY TECHNOLOGY CENTERS

Mr. YATES. You are going to reduce energy technology centers. Instead of five, you propose to have one or two in 1983.

Which are you planning to close?

Mr. MARES. The options we are looking at now, and there have been no final decisions by the Department, would be to develop a different institutional framework for Grand Forks, Laramie, and Bartlesville, and continue to operate, but with a reduced staff, the facilities at Pittsburgh and Morgantown.

The exact status of those options under review are as follows: In Grand Forks, we have had discussions with the University of North Dakota, including discussions with the president of that university, looking towards the possibility of transferring the facility to them. This seems appropriate since the facility is contiguous to the University of North Dakota, and professors and graduate students from the university have been working in close relations with us for many years. The current proposal is to transfer the facility to the university, probably to an operating foundation to be created by the university. The foundation would conduct research, not only for the Office of Fossil Energy, but also would have the capability to conduct research for other Federal Government Agencies, State agencies and private firms at a level that is consistent with the physical capability of the institution.

We would expect that the university would employ most of the Federal employees that are at the Grand Forks site today. I think there is a genuine interest on the part of the university in this.

There have been some fairly detailed discussions. We are reviewing the various issues and I would expect that we can resolve those issues.

One issue at Grand Forks, as well as at Laramie and Bartlesville, is that we would ultimately require some legislation to transfer title of the facility.

The Department of Energy has the authority to lease a facility for up to 5 years. We do not have the authority to dispose of a facility by very long-term lease or by an outright sale.

Mr. YATES. Right.

Mr. MARES. That is the GSA authority.

Mr. YATES. Okay.

Mr. MARES. In the discussions with the University of North Dakota, we have indicated that we would be prepared to enter into a contract for 3 years to have research done for us on low-rank coal, subject, of course, to congressional authorization at a level of about $4 million a year of research on low-rank coal.

As I say, we do not have the authority for a long-term lease of that facility, or for an outright transfer, so what we would expect is that the university would request that there be legislation prepared that would contemplate the permanent transfer of that facility to the university.

There has been an action similar to this in the Office of Fossil Energy within the past 12 months, specifically, involving the surface mining facility in Carbondale, Illinois. The judgment was made that it was no longer appropriate for us to continue to fund research in surface mining and that the facility was no longer needed. I believe language was included in an appropriation bill that contemplated the transfer of that facility to the Southern Illinois University at Carbondale.

We are moving positively in that direction. We would be supportive and encourage a transfer of this facility at Grand Forks which is physically adjacent to the university, to the university. The university would then, in this new institutional framework, operate the facility for us and perform research for Fossil Energy and others.

With respect to Laramie, the facility is also adjacent to a university. Most of the people and most of our facilities are located really on a corner of the University of Wyoming campus. I say "most," because about 2 miles on the outskirts of town the center also operates two retorts and a large Butler building in which there is some equipment.

We have carried on a conversation with the acting president of the university and several senior members of his staff who have been now designated into a task force to come up with a proposal for transferring the Laramie Energy Technology Center facilities to the University of Wyoming. The university would use it for fossil energy research under a contract with DOE for 3 years. The contract research would be related to oil shale and environmental work related to underground coal gasification. There is about $700,000 of environmental monitoring required at underground coal gasification sites and we will continue to support that in the 1983 budget.

So we would contemplate, there, too, that ultimately a legislative transfer of that facility to the University of Wyoming would be required.

I think that there is a very genuine interest on the part of University of Wyoming to embark upon taking this facility and creating a new institution that would do research, not only for the Federal Government, but for other interested parties as well.

Bartlesville is in some respects a more difficult situation, but in other respects, is an easier situation. It is more difficult because there is only a small college in Bartlesville. It is not a university that has a major scientific or engineering program.

Furthermore, it is not contiguous to the Bartlesville energy technology center. So, there is no immediate institutional framework into which the Bartlesville facility could conceivably be transferred in that community.

The more positive aspect is that the Bartlesville work is primarily advanced petroleum research and enhanced oil recovery. These areas are the subject of a great deal of interest in this country. I am confident that in a new institutional framework, they will find an opportunity to conduct work that is compatible with the work they would do for the Federal Government, and that is also meaningful for other paying customers.

What we are proposing here is a recognition that our recommendation in the President's budget for 1983 is lower in funding and staffing than it is today. When I reviewed both the funding level and the staffing level, I concluded that I could not, trying to be a rational manager, continue with five laboratories cut down to 40 percent in size.

I didn't think that would be a rational use of the Federal resources. Also recognizing that 85 percent of our budget is coal-related, I recommended that we try to find a different institutional framework for these three western centers.

Explicitly, what we are doing in Bartlesville at this stage is preparing a request for proposal whereby entities would submit a proposal to the Department for operation of the facility for the purpose of conducting research for the Federal Government.

We are going to continue to have the enhanced oil recovery and advanced petroleum research for several years to come. This new institution would provide a place for such work to continue just as it has been done at the Bartlesville Energy Technology Center in the past.

We would expect in this proposal that the new operator would be able to do supportive work for us in our Government-to-Government research relationships such as we have with Venezuela or with Canada.

We would expect them to be able to do studies for us on issues as they relate to petroleum, such as Bartlesville has done in the past. We would expect to have that proposal submitted around by June. This time frame would allow for a response, evaluation of the proposals, selection, and award of a contract that would accomplish the transfer.

I am gratified that at least so far there have been quite a few firms, both private profit and not for profit, that have expressed a serious interest in taking over the facility and doing work of the nature I have described.

I mentioned firms, but not universities. We have talked with a representative of one of the Oklahoma universities and we are more than willing to talk to other universities.

However, it is a bit more difficult for them simply because the scope of activities is probably not within any single university's gambit and to get two or three to put together a consortium is going to be complicated.

There, too, we have the authority to lease for up to 5 years, but would expect that any longer-term lease or more permanent transfer would require legislative consideration on the part of the Congress.

Mr. **Yates**. The committee is in receipt of a letter from Congressman Synar respecting the Bartlesville facility, and we will put the letter and all its supplemental material in the record at this point.

[The information follows:]

MIKE SYNAR
2d District, Oklahoma

Committees:
ENERGY AND COMMERCE
JUDICIARY

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April 30, 1982

The Honorable Sid Yates
Chairman
Subcommittee on the Interior
House Appropriations Committee
Washington, D.C. 20515

Dear Mr. Chairman:

I was extremely pleased to learn that the full Appropriations Committee had rejected the Administration's request for a deferral of $44 million for DOE's Fossil Fuels Research and Development program, since the deferral would have adversely impacted continued operation of the Bartlesville Energy Technology Center. Despite the Committee's recent action, however, the Bartlesville Center is still very much jeopardized by the Administration's proposal for a drastic cutback in funding for the Fossil Fuels R & D function for Fiscal Year 1983. As a result of this proposed cut, the Administration is considering a move to close the Bartlesville Center (BETC) -- the federal government's lead petroleum research laboratory since 1918. I also understand that, alternatively, there may be consideration given to the possibility of turning this federal facility over to a private foundation, research institute, university, or for-profit entity prior to the beginning of the new fiscal year. These two alternatives have been put forward despite the Center's relatively modest funding level and the importance of its work in long-term, high-risk energy technology.

I support cutbacks in federal programs where such cuts can be justified. However, the proposal to close this highly worthwhile and successful technology center is not in the national interest. I am equally concerned over the prospects for success of any immediate attempt to locate a private entity to continue the center's operations.

As you know, the Bartlesville Center has a long and distinguished history of achievement in high-risk petroleum research. BETC is a critical facet of our nation's long-term energy research and development effort -- particularly in areas such as enhanced oil recovery, which will play a major role in domestic energy production in the future. All of the center's work, as well as the significant benefits which will be derived from its work, are now in jeopardy by the Administration's shortsighted proposal.

The results of the center's research have been and will continue to be invaluable not only for America's energy program but to energy producing countries around the world. In the United States, BETC's work has been particularly important to the independent petroleum sector, by acting as a laboratory for and advisor to the thousands of independents who have no laboratory resources at their disposal. While BETC is the lead lab for enhanced oil recovery research, its work also includes petroleum processing research, thermodynamics and petroleum utilization. Although these areas of research have been of vital importance to the independents, BETC's work has not gone unnoticed by the major oil companies who frequently request technical exchanges with the center's scientists.

I would like to bring to your attention some additional facts about the Bartlesville Energy Technology Center which are of importance to the federal government, to other foreign governments and to our domestic energy efforts:

- BETC provides crucial support for the Strategic Petroleum Reserve program by conducting comprehensive physical and chemical analyses of the crude oils acquired or considered for acquisition for SPR, including compatibility testing. BETC is also conducting research on the effects of long-term storage on crude oil. This testing ensures that the crudes will be ready to use if and when it becomes necessary to draw from the Reserve in a national emergency.

- BETC is conducting research necessary for the Environmental Protection Agency to fulfill its regulatory commitments in the area of handling and disposal of waste oils.

- BETC supports the United States Air Force by conducting fundamental studies of high energy/high density fuels related to missile propulsion.

- The center is assisting Abu Dhabi in establishing its own Enhanced Oil Recovery Research Institute.

- On behalf of the U. S. government, the center recently entered into several research agreements with the government of Venezuela to exchange scientific information relating to heavy oil recovery and processing.

- The scientific research pursued at the center in the area of thermodynamics is considered among the finest in the world today.

- The center sponsors or cosponsors dozens of workshops and symposia each year. For instance, in conjunction with the Society of Petroleum Engineers, in 1981 BETC sponsored its annual Enhanced Oil Recovery Symposium, which attracted almost 1,800 participants, including 147 representatives from 20 foreign countries.

These are just a few examples of the work being conducted at the Bartlesville center. There are currently over 100 scientists and researchers at the center -- some of the most qualified in the nation in the area of petroleum research. There is no question that these professionals could do far better in the private sector. Instead, they have dedicated their careers to this critical federal research effort. Unfortunately, they are now faced with an extremely uncertain future. There is no doubt that the professionals will begin to leave the center over the next few months if we do not act quickly to ensure an adequate funding level for fiscal year 1983 and, just as importantly, a personnel level which will guanantee continuation of the center's important research work. Even if, for budgetary reasons, we are forced to pursue the alternative approach of federal funding in conjunction with a private entity, we will need many, many months to work out the details of any acceptable agreement. (As an aside, I simply want to say that my personal view on this latter "proposal" is that it is unworkable from a policy standpoint, particularly if no agreement could be reached which would guarantee that all results of the center's research would be public information.)

The center has distinguished itself both here in the United States and abroad, and it is inconceivable to me that the Administration would propose closing this center on the one hand, while professing to support this type of long-term, high-risk research on the other hand. As just a few examples of the recognition which this center has received, I am enclosing for your review a number of letters from people familiar with petroleum research in the United States. These people, as you will note from their letters, are extremely concerned over any proposal to close the Bartlesville Center.

As a member of the House Energy and Commerce Committee, and three energy subcommittees, I have been continually concerned over the future path of our domestic and international energy policies. From the domestic energy standpoint, I firmly believe -- as do many, many other Members of Congress -- that we in the federal government must do everything possible to foster increased development of and reliance on domestic energy resources. The Bartlesville center's work in the area of enhanced oil recovery is a perfect example of the unique role which the federal government can play to support the private energy industry in getting the utmost from our domestic resources. I would like to quote a statement from the enclosed letter from Max Klein, Senior Scientist, Thermodynamics, Gas Research Institute, concerning the similar closing of the Bureau of Mines' Amarillo laboratory: "...the closing of the laboratory ultimately was more costly to the nation in research not done than was represented by the money saved." From an international standpoint, I am very much concerned over the future of our commitments to other nations, such as our contracts with the government of Venezuala, which I mentioned earlier.

Just to sum up my personal view of the situation, I believe the Administration's proposal to close this center, or turn it over to a private entity, is penny-wise and pound-foolish in the extreme. In addition, the drastic reduction in fossil fuels research and development activities proposed by the Administration for the coming fiscal year represents just one part of a seriously imbalanced energy program for our nation which the Administration continues to pursue, despite its rejection last year by the Congress.

The United States leads the world in energy technology research and development. Despite our significant achievements to date, many of which have resulted from the work conducted at BETC, this is no time to abandon our longstanding commitment to federal support for high-risk, long-term petroleum research. The future payback in increased petroleum production and utilization, which benefits all of our citizens, is well worth the modest appropriation we provide for this center.

As your Subcommittee moves ahead with consideration of the FY83 funding for DOE's Fossil Fuels Research and Development function, I want to strongly urge you to flatly reject this latest proposal for elimination or transfer of the Bartlesville Energy Technology Center and include adequate funding and personnel to ensure its continued operation as the federal government's leading -- and highly successful -- petroleum research laboratory.

Your consideration in this matter is most appreciated by the many of us in Congress who support this vital research facility and its dedicated personnel.

With warmest personal regards.

Sincerely,

Mike

MIKE SYNAR
Member of Congress

Enclosures

MS/saz

gas research institute

1019 19th Street, N.W.
Suite 910
Washington, D.C. 20036
202/785-3423

April 6, 1982

Mr. Harry R. Johnson
BETC-DOE
P.O. Box 1398
Bartlesville, OK 74003

Dear Mr. Johnson:

I have heard that among the plans for retrenchment at the Department of Energy is one that includes the demise of the thermodynamics program at BETC. I find this depressing because it illustrates, once again, the research management crisis in this country which is going on largely undiagnosed. It is especially depressing since the mistakes already made nationwide in the management of fundamental research have resulted in losses whose effect is beginning to be felt at an accelerated rate and whose full impact is perhaps only two to three years away. This situation is perhaps at its worst in the area of thermodynamics with higher and higher percentages of meaningful work being done in Russia, Germany, and Japan. Fundamental research, like other creative endeavors, must be managed very carefully and not in the style in which most businesses and governments seem to have to be run. It cannot be operated in the roller coaster style of crisis management.

The thermodynamics program at Bartlesville has a deserved reputation for excellence especially in research on hydrocarbons. In a large number of instances, it is the BETC data which serves as the standard of accuracy. The research attitude and capability behind this have been built up painstakingly over the years. Their destruction can be accomplished in a matter of days. To rebuild when the coming realization arrives that there is a crisis in U.S. capability in thermodynamic measurements would again take years. The present staff is extremely competent and, as is always the case at a first-rate laboratory, the group is far more valuable than indicated by the simple sum of its parts. A good research organization, like the BETC thermodynamics program, makes full use of the collaborations and the serendipity which are possible.

I urge you very strongly to do all in your power to protect the existence of the thermodynamics program at BETC. Government budgets are being attacked with sledgehammers instead of scissors with the long-range good of the nation being totally ignored. The thermodynamics program at BETC has shown over and over again that its output can be of considerable technological utility far beyond the time scale for the applications which may have led to the original justification. This will most certainly be true of its recent concerns.

Gas Research Institute, 8600 West Bryn Mawr Avenue, Chicago, Illinois 60631 312/399-8100

The impact of basic research is so widespread and fundamental that its cost effectiveness is very hard to document in the same language used for evaluating manufacturing activities. In thermodynamics there are, however, countless examples of the enormous leverage ultimately associated with support of accurate fundamental measurements. The API program started by Rossini many decades ago has clearly not only paid for itself many times over but, had there been a mechanism for putting aside the savings obtained from better designs, would have generated enough funds to support a long-term and wide-ranging national research program. Measurements on ammonia, steam, methane, and other substances have been of extraordinary use to technology even when the original need was long forgotten. For example, the properties of ammonia were measured for the refrigeration industry just after World War I. The data published proved absolutely essential for the design of ammonia plants for fertilizer years later thereby helping to make the U.S. the major international designer and builder of such plants. This resulted in the generation of many jobs and contributed to a favorable balance of trade.

The major role of conservation and energy efficiency in solving our national energy problems is currently being demonstrated unambiguously. The role of research in thermodynamics in the development of increased efficiency in energy applications is too obvious to need description. Why then should our abilities as a nation in that area be in the process of being eliminated? It takes very little insight to see that a vital program like the thermodynamics program at Bartlesville is of extraordinary utility now and and will be even more useful in the near future. Keeping such a program intact will eventually show its managers to have had clear insight into the nation's long-term needs when the shortage of such facilities is finally perceived, as it obviously will.

I wish to caution you that in these kinds of bureaucratic battles, it is possible to win the battle but lose the war. You may recall that the Bureau of Mines laboratory at Amarillo avoided being dismantled at the appointed time only to be destroyed not long thereafter. As a result, several extraordinary researchers were lost to the nation because, at the time, their age and the general employment climate made it impossible for them to continue in similar work. I remind you, in particular, of the loss of Robert Barieau from thermodynamics research. His loss, in my opinion, was unnecessary, and the closing of the laboratory ultimately was more costly to the nation in research not done than was represented by the money saved.

Sincerely,

Max Klein
Senior Scientist
Thermodynamics

Gas Research Institute

Gulf Research & Development Company

R. A. Walde
VICE PRESIDENT
TECHNOLOGY GOVERNMENT COORDINATION

P O Drawer 2038
Pittsburgh, PA 15230

March 18, 1982

Mr. Jan W. Mares
Assistant Secretary
for Fossil Energy
U.S. Department of Energy
Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Mares:

I visited the Bartlesville Energy Technology Center on February 16 and 17 along with two of my colleagues, for the purpose of discussing the range of technical programs being carried out there which could be of value to Gulf. We identified a number of technologies of interest and will be working with the Technology Center personnel to acquire more details.

Over the years, we have had continuous contact with Bartlesville on a variety of special topics relating to petroleum properties, refining and production; and have always found their staff knowledgeable and cooperative. Our recent visit made even more apparent the vital role that the Technology Center continues to play in maintaining basic technology for the petroleum industry. Many of their activities relate to developing and maintaining data banks of fundamental information critical to the industry and filling in the technological gaps.

The recent news that Bartlesville may have to be closed as a result of the reduced budget has caused great concern. I am fully aware of the difficult decisions you must face in running the fossil energy programs within the substantially reduced budget. I would, though, like to ask that you make every effort to keep this valuable Technology Center open.

Thank you for your consideration.

Very truly yours,

R.A. Walde
R. A. Walde

RAW:mmm

Gulf

A SUBSIDIARY OF GULF OIL CORPORATION

TELEPHONE 412/665-6000

Massachusetts Institute of Technology

Office Of The Dean School Of Science Cambridge, Massachusetts 02139

February 24, 1982

Dr. Guy Fiske
Department of Energy
1000 Independence Ave, S.W.
Washington, D.C. 20585

Dr. George Keyworth
Office of Science and Technology Policy
Old Executive Office Building
Washington, D.C.

Dear Drs. Fiske and Keyworth:

I understand that the President's budget recommends closing the Bartlesville Energy Technology Center (BETC) of the Department of Energy, and so I am writing to express my concern at this step which will damage the energy R and D effort of the country. The mission of the BETC laboratory encompasses research in the extraction and production of petroleum, on its processing and refining, and on utilization. This laboratory is the government's lead laboratory for petroleum research and is the only federal facility dedicated to research on oil and natural gas.

In its 64-year history this laboratory has made major contributions to reservoir engineering, secondary and tertiary recovery, analyses and standardization of tests, thermodynamics, and safety information and pollution problems. It has done many kinds of research that need to be done for the country as a whole and not by each individual company. Thermodynamic measurements are an example. Basic thermochemical data is needed by all those who work with petroleum. The Bartlesville Energy Technology Center's thermodynamics laboratory is considered to be among the finest in the world. It is currently deeply involved in the characterization and identification of the heavy ends of petroleum, shale oil, and coal liquids. Basic thermodynamic data on these liquids and their components are sparse, and of rapidly increasing importance.

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Basic physical quantities like heat of combustion, entropy, and heat capacity for organic compounds are needed by many engineers and scientists who work on petroleum, coal, and synthetic fuels. These data are needed in research, design of plants, and in studying utilization. There is currently a serious lack of information on higher molecular weight substances in heavy ends of petroleum, in shale oil, and in liquids derived from coal. The national effort in this area is inadequate, but the Bartlesville Energy Technology Center has been making major contributions. For example, such data is essential for the design of coal liquefaction processes and the development of high energy/high density fuels for missile propulsion.

This laboratory also provides a fundamental data base on crude oil and syncrudes that is available to researchers in industry, government, and academic research centers through the BETC Crude Oil Analysis Data Bank. BETC also publishes properties of gasolines, diesel fuels, heating oils, and aviation fuels sold in the U.S.

I seriously hope that some way can be found to continue these important activities at the Bartlesville Energy Technology Center.

It is crucial to appreicate that the data and technology produced by BETC is available to the private sector, both industry and research universities, to improve the effectiveness of their efforts. The justification of federal sponsorship of research of this type is the benefits that all receive from the public availability of this type of data.

Sincerely yours,

Robert A. Alberty

Robert A. Alberty

RAA/k
xc: Dr. Jan Mares

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The
University of Oklahoma

Washington Office
(202) 223-9147

February 23, 1982

The Honorable Mike Synar
Room 1713 Longworth Building
Washington, DC 20515

My dear Congressman Synar:

The proposed closing of the Bartlesville Energy Technology Center (BETC) by the Department of Energy raises concerns about the future of petroleum research and development in the public sector. Although I believe the present petroleum R and D programs at BETC can and should be restructured to some extent, it is important to recognize that there is a significant role for the Center in addressing technological issues relative to the nation's future petroleum supply. For example, fundamental studies of reservoir properties and reservoir dynamics will become increasingly important as we attempt to increase the recovery of petroleum from newly discovered as well as existing fields. Increasing the average recovery factor from existing fields by only 10 percent would add 3 billion barrels to the nation's petroleum reserves. With finding costs in the range of $10 to $15 per barrel, a great deal of R and D funds could be profitably spent on improving recovery factors.

Fundamental studies of enhanced recovery methods would be a logical extention of investigations of basic reservoir properties and reservoir dynamics. Enhanced recovery of petroleum is not presently an economically viable activity but will become important in about a decade. The research needed to perfect this technology requires at least that much lead time.

There has been a suggestion that industry should do all the needed research in these areas. That view, in my opinion, does not recognize the diverse nature of the petroleum industry. There is a tendency to think of the Exxon's, the Mobil's, and the Shell's when one uses the term "petroleum industry". It is important to recognize, however, that the industry is composed of more that 15,000 operators. Most of the 25 large, integrated companies have inhouse research capabilities and do not rely to a great extent on public sector research. BETC's role and that of the other government petroleum-related laboratories should be to support the efforts of the small

One Dupont Circle, N.W. Suite 340 Washington, D.C. 20036

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companies and independents. It is this segment of the industry that drills most of the wells in the onshore U.S. and is therefore responsible for adding importantly to the nation's petroleum and natural gas reserves.

Although universities can contribute to the R and D effort and should be used more effectively in the future than they have been in the recent past, the role of BETC as a focal point for such research is, in my opinion, critical to the successful integration of these efforts. I would therefore urge the Congress to find ways to preserve this important facility. I recognize and applaud efforts to reduce federal expenditures but I also believe it is possible to be "penny wise and pound foolish." Closing BETC would, in my opinion, be such an action.

Please let me know if I can provide further information on the role BETC could perform in areas of petroleum R and D.

Sincerely yours,

Charles Mankin
Director
Oklahoma Geological Survey

CM/cl

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BROWN UNIVERSITY Providence, Rhode Island • 02912

DIVISION OF ENGINEERING

March 1, 1982

Dr. Oscar P. Manley
BES ER-15
Room J308
Department of Energy
Washington, DC 20545

Dear Dr. Manley,

The minutes of our third meeting have been distributed. After rereading them I had some thoughts which I wanted to share with you as well as with the members of the Technical Working Group on Thermophysical Properties of Synthetic and Related Fuels.

Normally, I would place such a matter on the agenda of the next meeting to give the other members a chance to contribute to the discussion. In this matter, however, I thought that I should express a personal opinion, because the matter may become moot if we wait too long. Nevertheless, the opinion is a personal one.

It is becoming increasingly clear to me that our report will recommend a multi-pronged approach, and that one important recommendation will be to foster the design, building and commissioning of apparatus for the measurement of thermophysical properties. Among them, calorimetric measurements are very important, particularly because they are either absent or only marginal at NBS. Thus, we may witness an increase in support for the development of experimental calorimetry at a time when the superb instrumentation at the Bartlesville Energy Technology Center will be dispersed or rendered inactive. This would amount to a regrettable waste of national resources. The imminence of two activities at cross-purposes to each other should, in my view, be brought to the attention of the proper authorities and averted.

I have emphasized calorimetry because of its decline in this country, but my remarks apply with equal force to the other facilities which exist at BETC.

Yours very sincerely,

Joseph

Joseph Kestin, Chairman
Technical Working Group on
Thermophysical Properties of
Synthetic and Related Fuels

JK:ss

cc: Distribution List for Minutes

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The
University of Oklahoma

**COLLEGE OF ENGINEERING**
School of Chemical Engineering
and Materials Science
202 West Boyd, Room 23
Norman, Oklahoma 73019
(405) 325-5811

February 26, 1982

The Honorable David McCurdy
313 Cannon Office Building
Washington, D. C. 20515

Dear Dave:

I am writing this letter as an interested engineer and scientist, to give my personal support to the effort to see that the DOE Bartlesville Energy Technology Center receives funding in future federal budgets.

I have worked closely with BETC personnel during the past two years in the development of a major workshop on design information for coal conversion processes and have numerous technical exchanges with BETC scientists. I believe BETC is a strategic resource for the United States. This country would not have as excellent a petroleum data base were it not for the BETC laboratory.

Two outstanding technical groups at BETC are the analysis/characteriaction group and the thermodynamics group. More of the sulfur compounds which occur in petroleum have been identified and isolated at BETC than any other laboratory in the world. The finest publically available methods of analyzing and characterizing petroleums were developed at BETC. Efforts to push to new generation methods for heavy oils and coal fluids are much needed today and the BETC group is needed to pursue this nationally important work. Some of the most accurate thermodynamic properties work on record has been obtained at the BETC laboratory. The properties of natural gas would not be nearly so well established were it not for the excellent thermodynamic properties measurements on methane performed at BETC.

The above are but two of the areas of work of national importance of BETC. There are others. I believe that BETC is a very important national resource. My own fossil energy research, one of the largest university research programs in the nation, would be the poorer if BETC were not funded. I offer my assistance in the effort to secure funding for BETC.

Sincerely,

Kenneth E. Starling

KES/lpl

cc. U. S. Legislators from State of Oklahoma
Harry Johnson, Director BETC ✓
William S. Banowsky, President - University of Oklahoma

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**knowledge box** editorial comment

# The Ambivalent Posterboy

THOSE WHO EDITORIALIZE for fun and profit trumpet the firm conviction that only through precepts they expouse can the city, the country, the state, the nation or the industry endure. They do not shilly - shally.

Which makes it difficult for yr. obt. svt. to address the issue of President Reagan and the DOE.

We are a disciple of Reaganomics. We believe that, given a fair trial, the President's policies will work. We extoll the virtues of pruning the Federal bureaucracy. We're ape for national defense, private enterprise and tax reduction. We're a regular little G.O.P. posterboy.

But there is talk of shutting down the DOE technology centers at Bartlesvile and Laramie, for crying out loud, and we aren't sure we're ready for that. As installations of the Bureau of Mines, ERDA and the Department of Energy, the Bartlesville and Laramie centers have been around so long that the mind of this man, at least, runneth not to the contrary. We don't know all that much about the technology centers at Morgantown, Pittsburgh and Grand Forks. They're coal labs. But Bartlesville and Laramie are home folks. They're oil patch.

On the bookshelf yonder, we have a vintage 1960 copy of BuMines Bulletin 582, "Petroleum and Natural Gas Fields in Wyoming," autographed by co-author Paul Biggs one day at his office on the University of Wyoming campus. It has saved our bacon more than once. And we have a drawer full of taped interviews with assorted Bartlesville smarts who've tried patiently to acquaint us with all those technical matters we manage to avoid while studying Maypole dancing at Dilettante U.

Under the circumstances, how can we applaud putting the cleaver to Bartlesville and Laramie? But, on the other hand, how can a deep-dyed, double-dipped devotees of Reaganomics fault knocking knots on the Department of Energy?

Acutally, our postion may not be as untenable as it appears. There's no denying that a lot of things are wrong with the Department of Energy. But, in eliminating what's wrong, we aren't compelled to eliminate, as well, what's right. Like Bartlesville's research into enhanced oil recovery and drilling, offshore and Artic technology. Like Laramie's research into extraction of shale oils.

Before such projects as those are scrapped, we'd like to be very sure that they will, indeed, be pursued with at least equal vigor by the private sector. Right now, we aren't that sure.

The nation needs every bit of drilling and recovery capability it can muster and the need will become more urgent as time goes by. There is little advantage in building warships, tanks and planes, for instance, unless we simultaneously insure that we can fuel and lubricate that military hardware.

To insure at least minimum long-range petroleum adequancy, we must move far beyond our existing technology. That calls for investment now in long-range research with remote and uncertain payout prospects. To the extent that profit-oriented private industry can assume those risks, they should be left to private industry. To whatever extent private industry cannot justify needed long-range research, we must have some such supplement as has existed through the years within the Bureau of Mines, ERDA and DOE.

We cannot say unequivocally that Bartlesville, Laramie or any other DOE installation must be retained unchanged and in full. They'll have to stand or fall on the strength of what they're doing, how badly it's needed, and whether there's a better way to achieve the same ends. But, before we dump them, let's be very sure we know what we're doing.

Very truly yours,

Editorial Director, Drilling

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# OPTIONS FOR MAINTAINING THE FUNCTIONS OF THE BARTLESVILLE ENERGY TECHNOLOGY CENTER:

## A WHITE PAPER

## SUMMARY

The Bartlesville Energy Technology Center (BETC) is a significant national asset, representing a unique combination of specialized facilities and equipment (with a replacement value of $50 million) and the "critical mass" of experienced petroleum professionals unbiased by proprietary interests.

The current BETC program emphasizes basic, high-risk, long-range research to benefit petroleum consumers and the Nation. Its priorities are enhanced oil recovery, low permeability ("tight") gas sands, improved liquids processing, and more efficient utilization. Its R&D is conducted in close collaboration with industry to assure its programs attack the highest priority problems and to avoid duplication with private research. In addition to this vital research program, BETC's professionals provide state-of-the-art technical expertise to the Federal government in domestic energy policy, U.S.-foreign government energy negotiations, a clearing-house for basic data, and government-industry liaison. These unique National functions are acknowledged to be important:

- The Administration's budget calls for continued petroleum research.
- Congress is considering increasing the budget for petroleum research through re-allocations or additional funding.
- Oklahoma's Governor Nigh, the Oklahoma Congressional delegation, and bipartisan support from other states have endorsed BETC's functions.
- The petroleum press has editorialized in favor of BETC's continuation (e.g., Oil and Gas Journal, Petroleum Engineer International, and Drilling Magazine).
- Representatives of major oil companies (e.g., Pete Silas, President of Phillips Petroleum), independents (e.g., Kye Trout, President of the Independent Petroleum Association of America), allied industries (e.g., Robert Parry, President of the American Chemical Society) and academia (e.g., James Gumnick, Executive Vice President of the Gulf Universities Research Consortium) have spoken out for the preservation of BETC's program and functions.

While the Administration's policy is to continue petroleum research, especially in enhanced oil recovery, the Administration also seeks to reduce the size of the Federal government. "De-federalization" of BETC -- continuing its functions but with scientists and engineers who are not Federal employees -- has been proposed to satisfy both these objectives. This analysis considers all available de-federalization options in a point-by-point comparison of their ability to carry out BETC's vital national functions and pragmatic feasibility of implementation. The primary conclusions are:

- Under the present timetable for BETC personnel ceilings (October 1, 1982), none of the options is viable. The "critical mass" of key scientists, engineers, and research managers who constitute BETC's unique capabilities will be dispersed to other employment before any of the options can be implemented. Thus, no matter what option is finally selected, the Center's national functions will be lost. Passive dismantlement is no different from an active decision to terminate the functions. Relaxation of the personnel ceilings is a prerequisite even to further consideration of BETC's future.

- Only two options -- a Federally chartered, broadly based research institute or continued Federal operation -- can feasibly perform all of BETC's functions. All the other options are compromised in major ways, ranging from simple cessation of the functions to the creation of publicly subsidized competition against existing contract research, engineering, consulting, and laboratory firms. Public involvement in some form and broadly based industry collaboration are necessary conditions for BETC's functions to be carried out.

- Whatever option is finally selected, stable funding is essential. Wide fluctuations in funding, or even the threat of such fluctuations, are incompatible with serious, substained pursuit of long-range, high-risk R&D.

These conclusions lead to the recommendation of at least a two-year moratorium on the personnel ceilings to assure continued availability of the "critical mass" of key people. During this time, all the options, including termination, can be considered in detail, prudent decisions can be made, and necessary implementation steps can be carried out.

# OPTIONS FOR MAINTAINING THE FUNCTIONS OF THE BARTLESVILLE ENERGY TECHNOLOGY CENTER:

## A WHITE PAPER

### ISSUE

Can the long-range petroleum research program now being conducted at the Bartlesville Energy Technology Center (BETC) be preserved through non-Federal support?

### INTRODUCTION

The Administration's Fiscal Year 1983 budget request for DOE/Fossil Energy is for a greatly reduced program that virtually eliminates all major applied research projects and focuses instead on longer-range, more basic research that has traditionally been supported by Government. Fossil Energy has been operating in a decentralized mode for several years, depending on five Energy Technology Centers (ETCs) for program implementation through a mix of in-house and contracted work. A much lower level of manpower is associated with the smaller budget. These new personnel ceilings are insufficient to maintain credible programs at all existing centers. Some consolidation, closings or transfers to other agencies will be required unless the personnel ceilings are relaxed.

BETC is a national asset, combining an excellent physical plant with unique research equipment (with a replacement value of more than $50 million) and the "critical mass" of skilled, experienced professionals required to implement an urgently needed program. Its projects are well directed, consistent with Administration policy, and serve the public interest. Petroleum will continue to play a key role in the Nation's future and the current program will continue to be vitally important.

### BACKGROUND

The need for basic petroleum research was recognized in 1918, with the founding of the Petroleum Research Station at Bartlesville, Oklahoma. Now the Bartlesville Energy Technology Center, its program has evolved to cover the complete petroleum cycle, from extraction, through processing, to refining.

In extraction, the highest priorities are enhanced oil recovery (EOR) and development of low permeability, "tight" gas sands. Both of these resources have massive potential for increasing domestic production, as both public and private studies have shown:

| Enhanced Oil Recovery | Total Incremental Recovery (Bill.B) | | Production in 2000 (MMB/D) | |
|---|---|---|---|---|
| (at world-oil prices) | Evolving Technol. | Advanced Technol. | Evolving Technol. | Advanced Technol. |
| Lewin and Associates (1977) | 17 | 37 | 2.0 | 3.6 |
| Nat'l. Petroleum Council (1978) | 13 | 24 | 1.5 | 2.4 |
| Office of Technology Assessment (1978) | 11 | 29 | 1.7 | 5.2 |
| RAND Corporation (1981) | 10 | 42 | -- | -- |
| Elkins (1982) | -- | 58 | -- | 3.5 |

| Tight Gas Sands | Total Recovery Potential (Tcf) | | Production in 2000 (Tcf/yr) | |
|---|---|---|---|---|
| (at $4-5/Mcf) | Evolving Technol. | Advanced Technol. | Evolving Technol. | Advanced Technol. |
| Lewin and Associates (1978) | 100 | 182 | 4.1 | 6.8 |
| Nat'l. Petroleum Council (1980) | 365 | 503 | -- | 8.3 |
| Gas Research Institute (1980) | 45 | 120 | 2.5 | 5.2 |
| Elkins (1982) | -- | 243 | -- | 6.8 |

The ranges in these estimates reflect real uncertainties about the resources and recovery processes. Because all of these studies used conservative methodologies, none of these estimates is implausible. In each case, the "evolving technology" estimate reflects current practice and advances through private R&D presently underway or planned. The "advanced technology," however, requires significantly increased levels of R&D effort. The BETC program is designed to provide essential components of these additional efforts, especially where economic and institutional limitations cause private R&D to be declined or deferred indefinitely. Private R&D is designed to meet specific company needs and to yield a reasonable rate of return. Long-range research has a lower private rate of return due to high risks and limited ability of individual companies to capture the benefits. Many gaps are left void where costly field pilot tests are prerequisite to major advances in fundamental understanding. Dissemination of emerging technologies to all parts of the industry will be delayed and invariably incomplete if we are wholly dependent on private R&D.

In processing, BETC's program focuses principally on basic research on the thermodynamic, physical and chemical properties of refinery feedstocks and products. Particular priorities are the processing of new feedstock mixes from EOR, heavy oils, and synthetics and the re-use of waste oils. Central to these efforts is assuring long range feedstock-refinery compatibility.

In utilization, BETC's program seeks to increase efficiency and environmental acceptability of new fuel-engine combinations and to assure the long-term compatibility of new and emerging engines with new fuels, especially those from synthetic (coal- and shale-derived) crudes, heavier crudes and alcohols.

In brief, the BETC program is an integrated approach of basic research and development aimed at increasing domestic petroleum supply and at processing and utilizing it efficiently over the long range.

In addition, BETC serves several other important National purposes. While these are lower priority than the R&D program, BETC is unique in being the nation's only institution with a "critical mass" of petroleum professionals who are both unbiased by proprietary interests and up-to-date in their knowledge of the state-of-the-art in the full range of petroleum technologies. These purposes are uniquely national responsibilities, including:

o Technical advice on national energy policy. At the core of many policy issues lies the hard reality of geology, technology, and costs. BETC advises the Federal Government on petroleum policy on the sound basis of science and engineering. Examples include technical assistance in designing special incentives for EOR and tight gas sands and engineering support on environmental and strategic petroleum reserve issues.

o U.S.-Foreign government relations in petroleum. Many nations support petroleum R&D, either for their own resources (e.g., Venezuela, Canada, USSR) or to develop export technologies that can be exchanged for imports from other countries (e.g., France, Germany, Japan). Several countries with national petroleum companies will deal with the U.S. only on a government-to-government basis (e.g., Mexico and Venezuela). In both cooperative research and international negotiations, BETC professionals are uniquely able to support U.S. positions from the technological perspective.

o Collection, publication, and clearing house for technical data. Although the petroleum professional societies and press are quite active in reporting summary results, no institution other than BETC has an incentive to collect, interpret, publish and manage indepth data and evaluations of field and laboratory results. This is especially true of field projects that were technically or economically unsuccessful. Understanding such "failures," however, may have more research value than clear "successes" in illuminating critical technological issues. Moreover, generation and publication of fundamental scientific data with many uses (e.g., thermodynamic properties of various crude oils and petroleum products or standardized evaluations of alternative fuels) is seldom a profitable enterprise. BETC has provided basic and evaluative data to the petroleum industry and the Nation since its founding.

- Government-industry liaison. Based on its expertise in science and engineering, and its independence from proprietary interests, BETC has been able to provide a two-way conduit between government and industry and between separate but technologically "linked" industries (e.g., fuel refining and automobile manufacturing). This two-way flow has continued despite fluctuations in public and official attitudes toward the petroleum industry and has resulted in realistic solutions to practical problems, e.g., in emissions standards, injected substances controls, health and safety issues, Federal leasing arrangements, and resource-conservation standards.

The integrated, long-range research program and these critical complementary functions are needed by the Nation as it faces the energy problems for the remainder of this century and the beginning of the next. This need has been articulated by the petroleum press (e.g., Oil and Gas Journal, Petroleum Engineer International, see attachments), the petroleum industry (both majors and independents) and elected officials who represent petroleum producing states. In response, the President has budgeted funds for Fiscal 1983 and Congress is considering still larger amounts.

However, the ability to implement a viable program depends on the continued existence of the unique combination of staff and facilities currently resident at BETC. Hardware and buildings can be bought and sold, but the existing unique "critical mass" of experienced petroleum professionals could not be reassembled in anything less than ten years.

Administration policy calls for "de-federalizing" BETC -- continuing the important mission, even if partially funded by the Federal government, but using non-Federal engineers and scientists. Several options have been suggested but none has been analyzed in detail. The purpose of this paper is to initiate this analysis.

The fact of the matter, however, is that the schedule for imposing the new personnel ceilings may precipitate individual employment decisions that could decimate the "critical mass" of petroleum professionals needed to carry out the central, nationally important mission. Simply stated, if the necessary scientists, engineers, and research managers are dispersed, the critical functions of BETC cannot be performed. Regardless of which option is ultimately selected, the key people will have found new opportunities, so the BETC functions will be lost.

Important to recognize is that the problem is not budgetary. BETC can continue to pursue its mission within the budgets proposed by the Administration or under consideration in the Congress. The critical issue is the schedule for de-federalization. The present schedule calls for full de-federalization by October 1, 1982. This timetable is incompatible with orderly implementation of any of the de-federalization options analyzed below. Thus, while the Administration, Congress, and the industry agree that BETC's role should be continued, the existing schedule denies continuation as a viable possibility.. Acknowledging this, the most "marketable" professionals are, wisely, exploring other employment options. At present, attractive offers from industry are under consideration by key BETC staff.

The national importance of BETC's functions, the timetable for de-federalization, the level of Federal commitment to petroleum research, and the real-life employment considerations of researchers and research managers must be weighed carefully. The analogy drawn by the Oil and Gas Journal, of amputation of a leg for the purpose of weight-loss, bears serious consideration.

## FRAMEWORK FOR ANALYSIS

A relatively small number of options are available for non-Federal operations of BETC. This analysis concentrates on the impact of each on the National program. It will be assumed, in all cases, that the bulk of the Federal petroleum budget would be available through contract to whatever organization assumes responsibility for BETC, and, whatever amount this is, it will not be enough to support both the institution and the program, i.e., some additional funding will be required. This latter assumption is consistent with both the FY 1983 budget request, the size of the current program, and the fact that BETC traditionally has derived part of its support from other DOE and Government offices.

The analysis consists of contrasting six available options (including continued Federal ownership and operation) against nine criteria. Table A shows the options, criteria, and assessments. Table B summarizes the information in Table A and provides a judgmental ranking of the options.

The criteria are of two types. The first are those that relate to the functions, described above, that BETC currently performs, called "function criteria" in the Tables. These include:

a. Long-term, high-risk petroleum research into enhanced oil recovery (EOR), tight gas sands, and the processing and utilization of all liquid fuels. This function is the highest priority of the five functions and requires the vast majority of the Center's personnel and financial resources.

b. Domestic energy policy technical advice on a broad range of issues relating especially to problems of petroleum science, engineering, and technology.

c. U.S.-Foreign government negotiations and cooperative R&D, including technical exchanges with Canada, Mexico, USSR, China, and a program of collaborative research with Venezuela and possibly other countries over time.

d. Collection, publication and clearing-house of detailed technical data concerning the new technologies, detailed evaluation and reporting of field tests, generation of basic data.

e. Government-industry liaison in interpreting and incorporating the science and engineering problems of the petroleum industry into the context of public policy and relating separate, but "linked," industries with rapidly changing technologies.

The benefits of these functions relative to their costs is evident. In brief, the Center's program, if fully funded, would cost in the $30-$40 million/year range. Its benefits can be seen in the differences between the "evolving" and "advanced" estimates described above:

o 11 to 30 billion barrels of enhanced recovery oil; and

o 75 to 135 trillion cubic feet of natural gas from tight formations.

Additional benefits are derived from improved productivity and efficiency in processing and utilization, and from the value of the four "complementary" functions performed by the Center. Based on these considerations and the positions of the Administration, Congress, and the industry, this paper takes as given that continuation of these functions benefit the Nation, the Federal Government, the petroleum industry, and consumers of oil and gas.

The second set of criteria concerns programmatic issues that must be resolved for the above functions to be performed. These include:

a. R&D Costs can vary significantly among the various options. If other factors are equal, lower costs would be preferred because more research can be conducted under a finite budget. Entries in Table A are rough indices of costs based on comparable management and operational situations.

b. "Critical mass" of scientists, engineers, and technical managers is essential to perform the functions. Assembling the expertise needed to plan, manage, conduct and evaluate this work would be difficult and time-consuming under any circumstance. Under current conditions, limited availability of petroleum professionals might make this assembly impossible -- the functions could cease while the needed personnel were being located, hired and trained in the advanced technologies currently being researched at BETC.

c. Stability of funding and programs is essential for long-range research and continuity in the other BETC functions. Budget fluctuations, or even the threat of fluctuations, can disrupt the integrity of the program, as managerial and professional attention is diverted from the research to budget justifications or career concerns. The need for organizations to sustain themselves generally causes them to seek ways of stabilizing funding, e.g., marketing services to private clients, long-term contracting arrangements, etc. This strategy in unavailable to most Federal operations, but can be expected from either non-profit or for-profit organizations unless otherwise constrained.

d. Feasibility of implementation timing is critically important. All of the options, other than continued Federal operations will require time for prudent design, legal agreements, and institutional arrangements. Without explicit relaxation of the schedule for imposing personnel ceilings -- announced essentially immediately -- the key scientists, engineers, and research managers who comprise the "critical mass" of personnel will find employment elsewhere. Without this "critical mass," the National functions of BETC cannot be performed.

Together, these two sets of criteria provide a framework for analyzing the respective options.

## ANALYSIS

Table A provides a point-by-point comparison of the options against the criteria. The analysis presented below summarizes only the significant aspects of the comparison. (Table B summarizes the assessment.)

Option 1. Federally Owned and Operated Center. This option is the *status quo*. It provides the base point of comparison among all the options.

Its advantages are that all of the major functions are established and ongoing; its costs are lowest so the most research can be done at any given budget level; the "critical mass" of personnel are in place (although key people have begun to look elsewhere for job opportunities); and it is easiest to implement.

Its principal disadvantages are the requirement for essentially immediate commitment to continued employment of the key personnel at BETC, and its effectiveness has been impaired by unstable funding and the current threat of closing.

The problem of funding instability arises from the lack of firm Federal commitment to BETC's functions and the absence of an articulate constituency. BETC's budget is subject to annual attack by persons who do not understand its functions and who find little support from the most immediate beneficiaries, the petroleum industry. Lack of vocal industry support is due to oil companies having the "larger" issues of prices and taxes between them and the Federal Government. The functions, programs, and personnel of BETC, however, find substantial support in industry, especially among technologists and independents who look to the Center to perform and publish research that they are unable to conduct.

Options 2 and 3: "GO-CO" with a Private Firm or Non-Profit Organization. There are many arrangements under which the Government contracts for the operation of its facilities. The generic reference of this relationship is "GO-CO," i.e., Government Owned-Contractor Operated. Frequently, the GO-CO facility, which operates on the basis of a cost-plus-fixed-fee contact, is designed for military production rather than research and development.

The operator of a GO-CO could be either a private, for-profit firm, or a not-for-profit organization such as a university. In the case of some ETCs (e.g., Laramie, Grand Forks, and Morgantown), proximity to a university faculty could make this option especially attractive. In Bartlesville's case, the nearest state university is 100 miles away, creating some logistical problems, but private universities in Tulsa might also be considered. Under either type operation, BETC would essentially become a small "National Laboratory."

A variation on the GO-CO theme would be a long-term contract on a "cooperative agreement" with a public or private organization providing part of the funding.

The principal advantages of both GO-CO options are that they lie within the FE personnel ceilings and would be capable of performing some, but not all, important BETC functions. They could, for example, perform long-range, high-risk R&D supported by Government contracts, and collect and publish technical data. With a non-profit sponsor, the GO-CO could advise on energy policy, and assist in Government-industry liaison problems. A corporate sponsor's credibility in either policy-making or liaison would be compromised if the firm's other business activities were petroleum-related.

The GO-CO options have several disadvantages. The first is that GO-CO's would be subject to the same funding instabilities as their federally operated counterpart. If outside private contracting were prohibited, the problem of funding instability would be the same as the principal disadvantage of continued Federal operation. As in that case, the time and attention of key senior technical personnel would be diverted from research and research management to budget justifications.

On the other hand, if the GO-CO operator were permitted to seek outside sources of funds a different problem can be predicted. For the same reasons that public support for long-range research is required, the majority of such outside funding would focus on short-range research and developmental engineering. It is questionable that both long-range research and short-range contract engineering can be effectively managed in the same organization. Without great caution, the incentives on the GO-CO managers would favor marketing the higher profit, "new" private work to build a stable business base over the longer-range but unstable, nationally oriented research.

A second disadvantage is that the minimum of six-to-nine months required to procure a private operator would dissipate the existing "critical mass" of key professionals. Because no individual operator would be selected until the end of the process, no firm job commitments could be made to present staff. Building such a capability "from scratch" would take many years because no existing organization has available internal resources of the depth and breadth of the existing BETC core staff.

Research costs would be 25-70% higher than present costs. This means that, for any given Federal budget level, the amount of research that could be performed would be reduced. At current, restricted funding levels, this could result simply in maintenance of liaison and advisory capabilities, with very little research.

Finally, the advisory and research functions BETC performs could be impaired if the operator had proprietary interests in the petroleum industry. Even if the operator initially had no direct ties to the petroleum industry, the necessity of funding stability would create incentives for private contracting. This would lead to the perception of the Center as a direct, but partially subsidized, competitor with private firms providing contract research, engineering, petroleum laboratory, and computing services. Either way, the flow of technical information from industry, through BETC, to the Federal Government would be severely reduced.

Even more damaging, the Center's ability to conduct long-range, nationally oriented research would be increasingly compromised. To the extent the Center is perceived as a competitor, consultations with private firms would cease and the Center would no longer have access to state-of-the-art developments outside its own operations.

Option 4. Private Take-over or Lease. Under the simplest version of this option, DOE leases the facilities to the highest bidder. Its principal advantage is that it would yield a return to the taxpayer for the estimated $50 million value of plant and equipment. But, the existing BETC functions would not be performed.

A variation on this option has been proposed to maintain BETC's key national functions: to supplement the lease with a long-term, guaranteed Federal contract to perform the functions. While this may appear to be a plausible approach, it suffers from an extreme form of all the disadvantages of the for-profit GO-CO option.

The instability of Federal funding would force the operator to seek outside, supplemental funding. For the same reasons that public support for long-range research currently has limited private support, the majority of such outside funding would focus on short-range research and developmental engineering.

Inevitably, a for-profit operation would reorient the research effort toward short-term goals and the same type of work now being done by the private sector. That new direction would place the Center in direct and open competition with private research groups and engineering organizations. The size and strength of this new profit-oriented entity would devastate the open relationship that now exists between the Center and industry.

Given the $50 million of existing plant and capital equipment plus a guaranteed multi-million dollar, multi-year contract from the Government, the organization assuming responsibility for BETC would have a distinct competitive advantage over other firms in the business. Competition for outside work would divert staff and facilities to more near term, client-specific issues, with the degradation of the existing national functions. As research became more private-oriented, the Center's credibility in its advisory functions would diminish instantly. Additional operating costs -- taxes, more competitive pay scales for petroleum engineers, and profit -- would result in less productive research per Federal dollar. Since much of the research would be done under private sponsorship, not all results would be generally available as they are at the present time. The Federal Government would lose an independent and unbiased source of information.

While this option would preserve the BETC facility, it would lead progressively to the loss of the long-range National program.

Option 5. Operation by a State or Local Agency. This option would maintain the physical plant and possibly retain some of the key personnel, but the key BETC functions would be lost as the emphasis changed from National problems to problems of local or regional concern. It would be extremely difficult for a state on locality to dedicate significant amounts of its tax base for the benefit of the Nation as a whole.

This option, however, might be viable for other ETCs. As an agency of the state or an extention of a university, cooperative arrangements might be made to continue some portion of the programs at Laramie, Grand Forks, and/or Morgantown. While some Federal financial support might be required, these Centers deal essentially with regional issues and are already co-located with their respective universities. On the other hand, BETC deals more with national and international issues. The program differences are more significant than the similarities.

A special case of this option would be the operation of the Center by a consortium of universities. Depending on the consortium's membership, this might sustain a National focus. While this might appear to be reasonable, it would take many years to negotiate all of the agreements necessary. No realistic relaxation of the Fossil Energy personnel ceilings would be long enough to implement this arrangement, so it is not considered further here.

Option 6. Semi-Private Broad-based Institute. For operations, this option is modeled broadly after the precedence of the Electric Power Research Institute (EPRI), the Gas Research Institute (GRI) and the Canadian "Five-Percent Club." Legally, it would take the form of a cooperative agreement or Federally chartered corporation. It would be a private, non-profit organization chartered to perform BETC's national functions exclusively. To maintain its commitment and capabilities to perform BETC's functions, its management direction would be provided by a board that is representative of the petroleum industry in its broadest definition (including majors, independents, drilling and service companies, pipeline companies, engineering firms, environmental and consumer organizations). Its charter would require performance of BETC's functions for the benefit of the Nation and the petroleum consumer. To insure compliance with this charter, annual plan reviews would include an appropriate Federal Government official, much as FERC reviews the plans of EPRI and GRI. (A variation on this would be ex-officio board membership by a Federal official, possibly with veto authority.) Plans and budgets would be evaluated relative to the extent they perform BETC's functions and are cost-effective. Funding could come from two sources: maintenance of the core advisory capability and distinct public-benefit research would be Federally supported. Research that benefits the industry at large, but not necessarily individual companies in particular, could be supported by voluntary contributions from industry, much as the National Petroleum Council (NPC) and the American Petroleum Institute (API) support their standing staff and facilities and pay for special studies in the public or industry-wide interest. Another analogy is the "Five Percent Club," in which Canadian industry funds fundamental petroleum research. A variation on this might be a new levy or an earmark on a small portion of the Windfall Profits Tax or any import fees that may be imposed. In any case, a one-cent per barrel charge on domestic production would provide a budget larger than BETC has at present.

Preliminary investigation suggests that the necessary legislation and precedents exist. The "cooperative agreement" and "Federally chartered corporation" statutes permit public-private collaboration and joint funding.

The advantages of this option are that the BETC functions and capabilities are maintained. The closer relationship with industry might even enhance the functions, effectiveness and accelerate the exchange of information. The broad representation of the board and the active participation by the public would sustain unbiased independence necessary to perform BETC's advisory functions. The Federal charter would facilitate international, government-to-government dealings. The "critical mass" of key personnel would be sustained and funding could even be stabilized. One variation that might be considered is partial phase-out of Federal funding in favor of standard "voluntary" contributions by industry that could be budgeted well in advance.

The principal disadvantages are twofold. First, an essentially immediate staff commitment would be required, even before a basic study of feasibility were available, to keep the "critical mass" of needed personnel. This would necessitate a temporary relaxation of the FE personnel limitations. Second, costs of the research would be higher, but this disadvantage might be partially mitigated by the private contributions over time.

## CONCLUSIONS

The foregoing analysis is summarized in Table B, using a simple "plus or minus" scheme, except for the R&D cost index and summary rankings. Examination of this Table leads to four conclusions:

First, direct, complete assumption of BETC facilities by either a private company (Option 4) or a state/local agency or university (Option 5) would fail to sustain the existing national BETC functions. This is not surprising because the unique functions that have evolved at BETC came about because no other institution or private concern has the incentives and capabilities to meet these uniquely national problems.

Second, Government-Owned/Contractor-Operated (GO-CO) options would be able to perform some but not all the key functions. Higher costs would limit the research per dollar of budget; and funding instability would be at least as great as for Federal operation, with the concommitant diversion of research management attention -- either toward private, short-term research or Federal budget justifications. Long procurement delay would seriously endanger maintenance of the "critical mass" of key scientists and engineers. Most importantly, under either public or private operation, the GO-CO would be extremely likely to evolve into a subsidized competition to existing private firms -- an outcome that would essentially eliminate its national purposes. Of the two GO-CO options, a non-profit operator (Option 3) has advantages over for-profit operators (Option 2). The non-profit is likely to have somewhat lower R&D costs and greater credibility on technical policy advice.

Third only two options appear to offer reasonable assurance of performing all the key functions -- continued Federal ownership and operation (Option 1) and the semi-private, broad-based institution (Option 6). In this regard, they are essentially the same, although the institute might be somewhat less effective in government-to-government exchanges and technical policy advice unless an "official" stamp remained clearly on its charter and organization.

The principal differences between the two options lie among the "programmatic criteria." Government operation is expected to have lower R&D costs than the institute due to higher private pay scales for petroleum professionals. This might be mitigated by contributions from industry. Either option necessitates extremely rapid commitment to existing personnel to maintain the critical mass of professionals. It is probably simpler for the Federal Government to act quickly on this than could a new institute, but this step could be one of several Federal contributions in a strategy that results in an institute. Instability of Federal funding and its impact on program integrity are major problems of

Federal operation, but combined Federal-industry funding for an institute under a cooperative agreement could increase funding stability. Continued Federal operation would require no special implementation, but establishing a semi-private, broadly based institute entails a large number of uncertainties.

The first three conclusions are summarized in the ranking of the options at the bottom of Table B.

The Fourth conclusion of this analysis is that four factors are decisive among the options:

- Federal participation in some form is necessary if the BETC national functions and program are to be preserved.
- Arrangements with individual, existing organizations to assume BETC's functions inherently run the risk of generating a publicly subsidized competitor to private petroleum research, engineering, and laboratory organizations. This outcome would result in an inability to perform either the research or advisory functions of BETC. Avoidance of this risk requires collaborative, nationally oriented arrangements with the petroleum industry and government, either through a broadly representative board or through direct Federal operation.
- Maintaining the critical mass of key scientists, engineers, and technical managers is an essential prerequisite to performing any of these functions, especially long-range interdisciplinary petroleum research. Immediate, concrete commitment to at least a core of existing BETC personnel is necessary because no other organization has this unique combination of education, skills, and expertise.
- Stable funding is also necessary condition to maintaining effectiveness in performing the functions, most particularly in long-term nationally oriented research and development.

## RECOMMENDATION

Continued Federal operation or a broadly representative semi-private institute are the only viable means of assuring all the unique national functions of BETC will be performed. Both provide for Federal participation. Both provide for collaborative, cross-industry participation. Both require immediate personnel commitments. Continued Federal operation fails to solve the funding stability problem, while the institute concept has major uncertainties about how it would be designed, whether it could be implemented, and whether it could make the necessary personnel commitments.

The following recommendations provide a reasonable solution to these problems:

- o The Federal Government makes an immediate, two-year commitment of employment of, at least, a solid core of the critical BETC personnel.

- o The Federal Government immediately requests the National Petroleum Council (NPC) to conduct a study of the desirability and feasibility of a semi-private, broad-based institute. The NPC is an ideal choice because:

  - -- Its membership is broadly representative of the petroleum industry, including consumers and environmentalists.

  - -- Its role, since World War II, has been to advise the Federal Government on technical petroleum issues.

  - -- It has scrupulously avoided any lobbying positions.

  - -- It has extensive experience in arranging and managing "voluntary" assessments from industry for the general welfare.

  - -- It has no direct "stake" in the outcome. Because of its limited permanent staff, restrictive charter, rotating officers, and high visibility, it would not construe itself as a potential operator of BETC.

- o If this study, which should take four to eight months, concludes that the institute is viable, it should recommend a suitable charter, board, organization structure, and operating procedures. Legal arrangements for a cooperative agreement or Federal charter should be incorporated into these recommendations.

- o Based on the results of this study:

  - -- If the study recommends proceeding with the institute, BETC in-place programs and staff represent a valid point of departure. Once the board and oversight procedures are implemented, the program and staffing would evolve as dictated by technological problems, programmatic requirements, and professional performance of the managers, scientists, engineers, administrators, and support staff.

  - -- If the study finds the institute to be either undesirable or infeasible, all other options, including termination of BETC, remain open, but the study's analyses and deliberations would be available to these later decisions.

These recommendations represent a realistic strategy for dealing with BETC's unique national functions in a thoughtful, prudent way.

Table A. Analysis of Options for Management of BETC

| CRITERIA | CURRENT SITUATION | OPTIONS | | | | |
|---|---|---|---|---|---|---|
| | 1. Federally Owned and Operated Center | 2. GO-CO with Private Firm | 3. GO-CO with Non-Profit Organization | 4. Private Take-over (or lease) | 5. State/Local Agency or University | 6. Semi-Private, Broad-Based Institute |
| **1. Function Criteria** | | | | | | |
| a. Long-term, high-risk petroleum research. | Established, will continue if funding stabilized and "critical mass" of professionals maintained. | Possible, but dependent on stable Federal funding; "critical mass" of professionals; private contracting could interfere. | Possible, but dependent on stable Federal funding, and "critical mass" of professionals; private contracting could interfere. | Unlikely; need for private contracts would interfere; could result in subsidized competition in private contract R&D. | Unlikely to reflect National needs. | Likely if unbiased independence maintained through representative governance and effective public oversight. |
| b. Domestic energy policy technical advice. | Credible if "critical mass" maintained. | Not credible if operator is from petroleum industry or significant private contracting. | Available if "critical mass" maintained and industry relations maintained. | Not credible | Credible on local problems. | Credible if independence maintained. |
| c. U.S.-Foreign government negotiations and cooperative R&D. | Established and effective if unbiased "critical mass" maintained. | Not possible | Not possible | Not possible | Not likely | Effective if unbiased independence maintained. |
| d. Collection, publication, and clearing-house of detailed technical data. | Established; future OK if funded. | OK if funded; possible proprietary problems. | OK if funded | Not likely; proprietary problems. | OK for local problems; unlikely for whole Nation. | OK if funded |
| e. Government-industry technical liaison. | Established; will continue if "critical mass" maintained. | Possible, but limited by proprietary interests and appearance of bias. | Possible, but requires "critical mass" and maintenance of industry relations. | Not likely; proprietary interests | Not likely beyond local problems. | OK if unbiased independence maintained. |
| **2. Pragmatic Criteria** | | | | | | |
| a. R&D Cost Index (Federal = 100) | 100 | 140-170 | 125-150 | 140-200 | 80-130 | 125-160 |
| b. "Critical mass" of scientists, engineers, and technical managers. | Exists and credible; requires immediate commitment to retain; uncertain future and unstable funding may drive people out. | Could hire existing staff, but unlikely soon enough to hold critical mass; learning curve problems with new employees; pension problems with existing employees. | Could hire existing staff, but unlikely soon enough to hold critical mass; learning curve problems with new employees; pension problems with existing employees. | Less likely to hire existing staff; difficult to establish "critical mass;" pension problems with existing employees. | Some of existing staff might be hired; pension problems (?) | Could start with "in-place" personnel, so "critical mass" maintained; performance evaluations could evolve new organizations/personnel; "new" organization could "grandfather" pensions. |
| c. Stability of funding and programs. | Major problem; annual political debate; multi-year commitment necessary for long-range research. | Major problem; annual political debate; multi-year commitment necessary for long-range research. | Major problem; annual political debate; multi-year commitment necessary for long-range research. | Major problem; large dependence on private contracts for stability. | Possible, depending on state/local budgets. | Could be acceptable with combination of industry-wide levy/contribution and/or stable Federal funding base. |
| d. Feasibility of Implementation Timing | Easiest, but requires explicit commitment, relaxation of personnel ceilings. | Procurement delay 6-9 months; "critical mass" seriously endangered. | Procurement delay 6-9 months; "critical mass" seriously endangered. | Procurement delay 6-9 months; "critical mass" seriously endangered. | Relatively easy transfer if agency willing to hire "staff-in-place." | Given "staff-in-place" commitment, could establish management direction and procedures over time through cooperative agreement. |

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OIL & GAS JOURNAL **EDITORIAL**

# Federal petroleum research slated for backdoor elimination via personnel cuts

President Reagan's proposal for trimming the federal energy budget would amputate a leg for the sake of losing weight.

He wants to reduce petroleum research expenditures to a tiny fraction of the shrunken energy budget, eliminating the energy technology centers at Bartlesville, Okla., and Laramie, Wyo. Closure of the technology centers, in fact, would be accomplished administratively, probably before Congress considered the budget move.

Prospects of such violent surgery cry out for a second opinion. There's no question that federal spending must be brought under control. And during its 64 years in the basic petroleum research business the government has not always spent money wisely. But federal petroleum research has filled an important support role in national energy progress—a role that should continue along with that of oil and gas in the U.S. energy mix for many years to come. It should be neither spared the rigors of government fat trimming nor radically removed.

Oil and gas, which account for nearly two-thirds of U.S. energy use, receive short shrift in the proposed $11 billion Department of Energy budget. Petroleum research would receive only $16 million. That might make sense if oil and gas were not going to be the prime energy sources well into the 21st century—a faulty assumption that was the keystone of the Carter administration's disastrous energy program. The oil and gas contribution to future energy supply will be partly a function of how well new exploration and recovery methods are developed. Government can and should be part of those developments.

Congress, however, may not even get the chance to review government's withdrawal from petroleum research. Jan Mares, assistant secretary of Energy for fossil fuels, says his department will consolidate the five fossil fuel research centers and begin manpower reductions this month. For the two petroleum centers, consolidation means shutdown. They would not survive the planned staff cuts to 511 from the 1,120 now working at the five research centers. Therefore, by the time Congress considers the petroleum research cuts, there may be no such operations left to consider for rescue.

Certainly, in the absence of federal petroleum research, private companies would continue their own efforts. But those efforts would be directed to the companies' own operations, and their objectives would be specific and commercial. Missing would be the basic research, aimed at national objectives, to reinforce the private effort.

It has been suggested that the research centers be taken over by universities or other private institutions to preserve research programs. That might save the facilities. But it would shift the focus of research away from fulfillment of national energy objectives. And it wouldn't solve another problem that closure of the petroleum research centers would raise—that of removing from government positions persons with petroleum expertise. Many times, industry and government both have benefited from the reasoned counsel of officials at the Bartlesville and Laramie centers.

If the shutdowns proceed, therefore, industry will lose not only valuable research but also sane voices on energy issues within government. Companies could do more than they have so far to prevent that from happening. Congressional committees, too, should be concerned.

Otherwise, an important policy proposal they must review will be a fait accompli, making their role in the decision a charade.

And there is a broader consideration that should not get lost in the debate. The federal government is extracting $15-20 billion/year from oil producers via the windfall profits tax—a cost which is passed through to purchasers of products made from oil produced in the U.S. Congress and the administration—which wants to earmark revenues from the tax for the "new federalism" trust fund—betray oil users if they do not reinvest at least some of the proceeds in future oil and gas supply.

With future energy supply a matter of critical national concern, government has a legitimate part to play in basic energy research, including oil and gas research. It would be unfortunate if Congress decided to the contrary. But it would be tragic if it were not given the chance to consider the matter.

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Table B. Summary Assessment of Options for Management of BETC

| | CURRENT SITUATION | OPTIONS | | | | |
|---|---|---|---|---|---|---|
| CRITERIA | 1. Federally Owned and Operated Center | 2. GO-CO with Private Firm | 3. GO-CO with Non-Profit Organization | 4. Private Take-over (or lease) | 5. State/Local Agency or University | 6. Semi-Private, Broad-Based Institute |
| 1. Function Criteria | | | | | | |
| a. Long-term, high-risk petroleum research | ++ | ++? | ++? | - | - | ++ |
| b. Domestic energy policy technical advice. | ++ | - | + | - | - | ++? |
| c. U.S.-Foreign government negotiations and cooperative R&D | ++ | - | - | - | - | + |
| d. Collection, publication, and clearinghouse of detailed technical data. | ++ | + | ++ | - | - | ++ |
| e. Government-industry technical liaison. | ++ | + | ++ | - | + | ++ |
| 2. Pragmatic Criteria | | | | | | |
| a. R&D Cost Index (Federal = 100) | 100 | 140-170 | 125-150 | 140-200 | 80-130 | 125-160 |
| b. "Critical mass" of scientists, engineers, and technical managers. | ++? | ±? | ±? | - | - | +? |
| c. Stability of funding and programs. | - | - | - | + | ±? | +? |
| d. Feasibility of Implementation Timing | ++ | - | - | - | + | ±? |
| SUMMARY RANKING (A = High) | A | C | B | E | D | A |

## Course of Oil...

Editorial from Petroleum Engineer International, November 1981, p. 6

# "Goodbye DOE"

We are hearing good things out of Washington these days. Taxes are going down, give-aways are being curtailed, and the budget will be balanced one way or another before too long.

And there's a bonus on top of that. President Reagan has more than hinted that the Department of Energy is not long for this world! Hooray! Of all the help the oil industry could have used in the past few years, it didn't need the DOE.

There's no way to determine just how much DOE has cost the industry and the taxpayers since its organization. While the Proxmires of this world were campaigning against oil's "obscene" profits, DOE was spending billions and wasting more. Its thousands of regulations resulted in mountains of paper that will never be looked at again – mountains of reports prepared at tremendous cost by oil and gas company technical people whose talents could have been put to better use.

Ours is a dynamic industry now in the midst of explosive growth. DOE came along at exactly the wrong time and provided nothing but stumbling blocks and other deterrents to progress. It's time – past time – for DOE to go. The sooner President Reagan can get shed of it – as we say in the oil patch – the better.

But we have one reservation. We mentioned this before, but it deserves mentioning again. The Bartlesville, Okla., research facility should not be discussed in the same breath with its DOE parent. True, it has had to conform to Washington dictates, and some bureaucratic tarnish can be found in a few offices and laboratories. But on the whole, it has made significant contributions to oil and gas technology. Some of the EOR projects it supported were marginal at the outset and proved to be huge failures, but failure is frequently a better teacher than success. The industry could profit from a disclosure of all failures experienced by all operators. A compendium of failure write-ups would make an invaluable text.

The old letterheads out of Bartlesville – USBM Petroleum Experiment Station – would sure look good right now.

Other good news out of Washington is the performance of Secretary Watt of the Interior Department. He must be on the side of progress because the environmentalists oppose his every move.

There are several things standing in the way of solutions to the energy problem. Among them are a shortage of deep-well drilling rigs, a shortage of high-strength tubulars and other equipment, a shortage of skilled manpower, and a shortage of good geological prospects.

We can do something about the equipment shortages, and we are doing it. Many observers are predicting a surplus of rigs within the next 2 or 3 years. And time will solve the manpower problem as more and more people gain experience through training – whether on the job or in one of the many schools now operating.

But we cannot have good geologic prospects from which to choose if federal lands are not made available for exploration and exploitation of oil and gas reserves. Secretary Watt wants to change this but has drawn the ire of the do-gooders. Environmentalists would have you believe he is opting for drilling rigs atop George Washington's bust on Mt. Rushmore, in the bottom of the Grand Canyon, or at Inspiration Point in Bryce Canyon National Park.

Now no one loves natural beauty as much as we do, but our industry has proved it can work in sensitive areas without destroying them. If there is any change at all, it is usually for the better. The same folks who opposed platforms in the Gulf of Mexico now spend their weekends there making record catches of trout, snapper, and redfish. Early concerns for the well being of caribou because of the Alyeska Pipeline were groundless and the expensive crossings constructed for their convenience have gone unused.

Current statements from the do-gooders have as little basis as did these earlier claims.

The coalition of environmentalists and the DOE have spelled nothing but trouble for the industry and for the nation as a whole. If both prevail, we can look to a gloomy future.

During last year's political campaigns, we sported a bumper sticker which read "Goodbye Jimmy". It's time for a new one – "Goodbye DOE". – *W. B. Bleakley*

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**knowledge box** editorial comment

# The Ambivalent Posterboy

THOSE WHO EDITORIALIZE for fun and profit trumpet the firm conviction that only through precepts they expouse can the city, the country, the state, the nation or the industry endure. They do not shilly - shally.

Which makes it difficult for yr. obt. svt. to address the issue of President Reagan and the DOE.

We are a disciple of Reaganomics. We believe that, given a fair trial, the President's policies will work. We extoll the virtues of pruning the Federal bureaucracy. We're ape for national defense, private enterprise and tax reduction. We're a regular little G.O.P. posterboy.

But there is talk of shutting down the DOE technology centers at Bartlesvile and Laramie, for crying out loud, and we aren't sure we're ready for that. As installations of the Bureau of Mines, ERDA and the Department of Energy, the Bartlesville and Laramie centers have been around so long that the mind of this man, at least, runneth not to the contrary. We don't know all that much about the technology centers at Morgantown, Pittsburgh and Grand Forks. They're coal labs. But Bartlesville and Laramie are home folks. They're oil patch.

On the bookshelf yonder, we have a vintage 1960 copy of BuMines Bulletin 582, "Petroleum and Natural Gas Fields in Wyoming," autographed by co-author Paul Biggs one day at his office on the University of Wyoming campus. It has saved our bacon more than once. And we have a drawer full of taped interviews with assorted Bartlesville smarts who've tried patiently to acquaint us with all those technical matters we manage to avoid while studying Maypole dancing at Dilettante U.

Under the circumstances, how can we applaud putting the cleaver to Bartlesville and Laramie? But, on the other hand, how can a deep-dyed, double-dipped devotees of Reaganomics fault knocking knots on the Department of Energy?

Acutally, our postion may not be as untenable as it appears. There's no denying that a lot of things are wrong with the Department of Energy. But, in eliminating what's wrong, we aren't compelled to eliminate, as well, what's right. Like Bartlesville's research into enhanced oil recovery and drilling, offshore and Artic technology. Like Laramie's research into extraction of shale oils.

Before such projects as those are scrapped, we'd like to be very sure that they will, indeed, be pursued with at least equal vigor by the private sector. Right now, we aren't that sure.

The nation needs every bit of drilling and recovery capability it can muster and the need will become more urgent as time goes by. There is little advantage in building warships, tanks and planes, for instance, unless we simultaneously insure that we can fuel and lubricate that military hardware.

To ensure at least minimum long-range petroleum adequancy, we must move far beyond our existing technology. That calls for investment now in long-range research with remote and uncertain payout prospects. To the extent that profit-oriented private industry can assume those risks, they should be left to private industry. To whatever extent private industry cannot justify needed long-range research, we must have some such supplement as has existed through the years within the Bureau of Mines, ERDA and DOE.

We cannot say unequivocally that Bartlesville, Laramie or any other DOE installation must be retained unchanged and in full. They'll have to stand or fall on the strength of what they're doing, how badly it's needed, and whether there's a better way to achieve the same ends. But, before we dump them, let's be very sure we know what we're doing.

Very truly yours,

Editorial Director, Drilling

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processes requiring fresh water should be started before breakthrough to lower costs and lessen problems," company president Ben Sloat said.

Sloat described the project at the SPE/DOE symposium in Tulsa last week.

The Isenhour flood consists of six producers and three injectors drilled on an irregular pattern covering 173 acres. Current production is about 30 b/d of oil, with an equal amount of water.

Two of the producers have not shown any response because of the poor performance of one of the injectors, Sloat said. To aid recovery, Tiorco may drill another injection well and two more producers. It also plans to convert a producer to an injector and to resume polymer injection into all the injection wells.

Laboratory tests measuring interfacial tension were started in May 1979. Soda ash outperformed sodium hydroxide and was chosen for the flood.

In addition to decreasing interfacial tension better than sodium hydroxide, the soda ash, which is mined 100 miles away from the field, could be purchased for about half the price, Sloat said. He also said dry soda ash is more easily handled than liquid caustics in cold weather.

Injection is into the Almy sand at 3,700′. Net pay is 15′, porosity is 15.5% and permeability averages 21 md. Oil gravity is 43° API and viscosity is 2.8 cp.

## DOE official argues for closing BETC

Unless it can line up private investors, the Bartlesville (Okla.) Energy Technology Center probably will close its doors by October, according to a federal Energy Department official.

"We cannot continue to maintain more than two fossil-energy centers" under DOE's proposed 1983 budget, Assistant Secretary Jan Mares said last week. The agency now operates five energy research centers — Bartlesville, Pittsburgh, Morgantown, W.Va., Grand Forks, N.D., and Laramie, Wyo.

The decision as to which will remain open is one of the "most difficult" facing DOE in the coming months, Mares told the SPE/DOE EOR symposium. Although the final decision rests with Energy Secretary James Edwards, Mares said he had recommended that only Pittsburgh and Morgantown continue to get federal money.

The Morgantown and Pittsburgh centers, which are primarily involved in coal research, are the largest of the five, and are the closest to Washington, D.C. — which apparently figures heavily in their favor.

Upwards of 85% of DOE's fossil-energy research funds are earmarked for coal research under the 1983 budget, Mares said.

Despite the likely closing of BETC, Mares said DOE remained committed to a federal role in enhanced oil recovery research. "We do recognize that EOR is important. We are going to fund it in 1983, and I expect thereafter," he said.

One project scheduled to receive continued funding is the computer data base put together by BETC. Mares said that the gathering and transfer of technical knowledge was one of the Bartlesville center's biggest accomplishments.

The feds will fund "areas that attract no commercial interest or venture capital," he said. Included in that category will be basic research into interfacial tension, mobility control and flow properties. Other areas likely to receive funding are steaming and mining of light oil, and microbial EOR, Mares said.

Oklahoma Gov. George Nighe said the feds' priorities were "mixed up if we close down a research center like this, when what we should be doing is stepping up research and development." He added that Oklahoma had supported BETC for years, and would continue to do so.

Mares acknowledged the state's support, but said that last year it amounted to just $250,000 of BETC's $10 million budget.

Kye Trout, chairman of the Independent Petroleum Assn. of America, said the government has a vested interest in keeping BETC open, because as the nation's largest landowner it could profit from EOR research. He also said funding for the center was "relatively minute," and closing its doors would offer only small savings.

## 10 billion barrels seen abandoned each year

The abandonment of oilfields before tertiary recovery methods are tried may permanently lock out EOR candidate fields from future production, University of Houston Professor E.L. Claridge said.

In a presentation delivered to Congress recently as part of testimony by Gulf Universities Research Consortium, Claridge called for a much-reduced windfall-tax rate on "any oil which a company produces, so long as the money thus made available is used for qualified enhanced oil projects."

The failure to adopt such a policy will have large-scale consequences in Texas alone, he said.

"The rate of abandonment of the current target for enhanced oil recovery is very significant,

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## HEADQUARTERS REDUCTION IN FORCE

Mr. YATES. Let me ask you another question. Are you planning to reduce your headquarters staff to 100 or less by the end of fiscal year 1982?

Mr. MARES. Let me answer with a yes or no.

Mr. YATES. It should be a rather short one.

Mr. MARES. A short answer is not a clear answer and it is too important a question. We are moving in that direction, but let me elaborate on it.

In the course of reviewing my 1982 program, organizational structure, and staffing limits, I became more and more convinced that we could intelligently and successfully manage our 1982 program with fewer people at headquarters than we have today.

Furthermore, we have an approved staffing and monetary budget for fiscal year 1982.

As of this moment, I am running at a level in excess of what my staffing limit is for 1982.

I have to make some moves in order to live within my budget. I have, as I say, reviewed the various options available to me, and as of this moment, my recommendation is, and my judgment is, that I can intelligently manage our 1982 program with 100 people at headquarters. By making a move late this summer to reduce the staffing down to that level, I will almost meet my staffing targets for 1982.

I don't quite meet them, but I almost meet it by doing that.

Mr. YATES. Has the reason for your reduction been the OMB-imposed personnel ceiling or is it something else?

Mr. MARES. As well as my evaluation of the number of people required to manage the program at headquarters. You probably have heard in the past with fossil energy, we have been moving to decentralize the execution of our program.

We look upon headquarters as being the group that, in general terms, develops the programs, identifies the general goals, but headquarters is not supposed to execute the program.

We have most of our program executed at the ETC's in the field and, in a few cases, by national labs.

But we would believe that we can intelligently manage our program with the people at headquarters that we have there today.

## SRC-I

Mr. YATES. Let's turn to synthetics, tell us about SRC-I. Do you think SRC-I is a likely candidate for the Synthetic Fuels Corporation?

Mr. MARES. I think that question ought to be better asked of the sponsors of that than ourselves.

Mr. YATES. You mean the companies?

Mr. MARES. Air Products and Wheelabrator-Frye.

Mr. YATES. It should be asked of them, but what I was trying to get was your judgment on the situation.

Mr. MARES. Let me elaborate, if I may?

Mr. YATES. Not too long.

Mr. **Mares**. We committed to provide the Congress by the 1st of May, but we had to delay to the 1st of June, a baseline estimate of what the SRC–I project might cost.

That information is being developed within my office. We expect to deliver such an estimate to the Congress on the 1st of June and at such time, we will make our recommendation regarding what we think ought to be done regarding funds required.

Mr. **Yates**. We have your letter of March 12, 1982, which contains the statement you just made.

I think we ought to put the letter into the record at this point.

[The information follows:]

Department of Energy,
*Washington, D.C., March 12, 1982.*

Hon. Sidney R. Yates,
*Chairman, Subcommittee on Interior and Related Agencies, Committee on Appropriations, House of Representatives, Washington, D.C.*

Dear Mr. Chairman: The Department of the Interior and Related Agencies Appropriation Bill for 1982 requires that the Department of Energy provide a definitive cost estimate of the Solvent Refined Coal-I (SRC–I) Demonstration Project to the Committee by May 1, 1982.

The SRC–I contractor, the International Coal Refining Company (ICRC) on February 11, 1982, requested a one month time extension. Unforseen problems with delivery of subcontractor data, which supports the cost estimate, have made it difficult for ICRC to integrate all component estimates and deliver a high quality definitive cost estimate. Both ICRC and the Department of Energy (DOE) desire a high quality definitive cost estimate on which Congressional decisions can be based. Consequently, DOE supports the ICRC request and will provide the definitive cost estimate to the Committee by June 1, 1982, in lieu of May 1, 1982.

Thank you for your cooperation and understanding regarding this delay.

Sincerely,

Jan W. Mares,
*Assistant Secretary for Fossil Energy.*

## REDUCTION IN FORCE

Mr. **Mares**. Could I go back to the question of headquarters for just a moment, because it is something that——

Mr. **Yates**. You mean numbers of people?

Mr. **Mares**. Number of people and the reductions there. It is something that is of concern to us. There is not any manager I have ever met who likes to reduce forces or organization. It is probably the most painful action any manager ever takes.

Yet, it is also one that has to be addressed from time to time in every organization and has to be addressed in as rational a way as one can.

As I say, I have made a review of what I think we require and I have made that judgment. We have also been looking at the various ways that we can to provide assistance to our people.

I have established two working groups to coordinate all the outplacement assistance. One group involves clerical, one involves professionals.

We will provide a book of employee profiles to Government agencies and to private organizations in order to provide that kind of assistance. We are going to have the Office of Personnel Management conduct retirement seminars for all eligible people. I have sent a memo to the Office of Personnel within our Department, asking them for early-out authority from the OPM.

We are going to select and hire a contractor to provide basic employee assistance by initially conducting workshops in these areas.

So we are going to try to do what we can to ease this transition and mitigate the impact for our people.

### SRC-I

Mr. YATES. Last year, the Administration thought that Government participation in SRC-I should be terminated.

Do you still hold that point of view?

Mr. MARES. The view was, I think, that the Federal Government should not fund demonstration of SRC-I as a line item within the Department of Energy.

That would still be our view.

Mr. YATES. Would there be termination costs to the Government if no further funding is provided to SRC-I?

Mr. MARES. Yes.

Mr. YATES. Do you have any idea how much they would be?

Mr. MARES. I am told about $20 million to $25 million.

Mr. YATES. Okay.

Mr. MARES. I don't want to be held to that number. We will probably negotiate it.

Mr. YATES. What is the status of the SRC pilot plant at Wilsonville?

Mr. MARES. The pilot plant is owned by EPRI and DOE. We have been funding work there in support of not only the SRC-I process, but also some of the coal liquefaction processes that we want to continue to fund.

We expect to have adequate funding to continue the operation of the facility jointly with EPRI during most of fiscal year 1983.

Mr. YATES. Do you have any indication from Electric Power Research Institute that it will continue to fund Wilsonville if DOE doesn't support it in fiscal year 1983?

Mr. MARES. Well——

Mr. YATES. Who owns that?

Mr. MARES. It is owned by EPRI. We do not own it.

Mr. YATES. I see.

Mr. MARES. We have sufficient funding and we have been talking to EPRI about testing we would like to have conducted at Wilsonville. I believe there is sufficient funding from our part to be sure that it operates through most of 1983.

Mr. YATES. What are the annual operating costs of the SRC-I pilot plant? Do you have that?

Mr. MARES. It is about $9 million per year.

Mr. YATES. What portion of that is DOE financed?

Mr. MARES. About a third.

[COMMITTEE NOTE.—Subsequent to the hearing, DOE informed the committee that about 80 percent of the annual operating costs of the SRC-I pilot plant is DOE financed.]

### SRC-II

Mr. YATES. Is there any activity in the private sector on SRC-II since Government involvement has been terminated?

Mr. MARES. Activity in terms of trying to bring the project forward?

Mr. YATES. Yes.

Mr. MARES. Not to my knowledge.

Mr. YATES. Has the Ft. Lewis, Washington, SRC plant been mothballed at this point?

Mr. MARES. We are trying to dispose of that facility and it will probably be dismantled.

Mr. YATES. What would the cost of dismantlement be?

Mr. MARES. We are soliciting bids for dismantlement of that facility. I do not have the number at my fingertips.

[The information follows:]

Onsite dismantlement and decontamination is currently (June 1982) underway at no cost to the Government. Decontamination of a one-acre offsite spill area will be subject to competitive bidding upon completion of an assessment as to what decontamination measures may be necessary.

## CONTROL TECHNOLOGY

Mr. YATES. Let's turn to the combined flue gas cleaning. Is it expected that they could be used to help control acid rain?

Mr. MARES. If they are ultimately proven successful and commercially developed, yes.

Mr. YATES. In what way?

Mr. MARES. Well, the concept that we are working on is to remove both $SO_x$ and $NO_x$ essentially simultaneously in one process step or consolidated process step instead of two different processes.

Mr. YATES. But you won't know the answer to that for years because it is in development?

Mr. MARES. We are early in the stages of testing the ideas. The next step is proof of concept facilities at a small scale and we will be at that stage at the end of fiscal year 1983.

Mr. YATES. Doesn't your request for less funds require the stretching out of that process? Wouldn't it have been better to provide funding that would permit expediting the program rather than phasing it over a longer period of time?

Mr. MARES. One has to be very careful. Just because one provides money, does not always insure that it can be spent intelligently. In this case——

Mr. YATES. I know, but we are talking about this case.

Mr. MARES. In this case, doubling the money would not be an intelligent use of funds on these particular concepts. The bench-scale work we are funding now didn't get initiated as early in the year of 1982 as originally contemplated. We are not going to be ready for proof-of-concept work, which is the next phase of testing, until the end of 1983.

Mr. YATES. How do you account for your statement at page 22 of the justifications, you say: "Although these projects have shown promise, fiscal constraint has necessitated a stretchout of these programs."

So the answer to my question was——

Mr. MARES. There is some stretchout, but it is not likely——

Mr. **Yates**. We could have had an answer, in other words, at an earlier date than the end of 1983?

Mr. **Mares**. Measured in months, not in years.

Mr. **Yates**. We have to measure it in months, because you only have months until the end of fiscal year 1983, correct?

Mr. **Mares**. Correct.

Mr. **Yates**. Will your request for funds support the process being developed by the Pittsburgh Environmental and Engineering Systems, Inc., as well as the electron irradiation process?

Mr. **Mares**. The latter one, yes. The former, I don't know which you refer to. Would you be more explicit?

We're continuing in both electronic irradiation and advanced chemical processes technology, that may be what you are referring to.

Mr. **Yates**. That is what I have in mind. It was discussed in last year's hearings.

Coal production is being doubled in the next generation, would you expect?

Mr. **Mares**. Yes, sir.

Mr. **Yates**. Will coal sampling and washability tests become more significant?

Mr. **Mares**. I think the work that we were doing was to understand a bit better the fine coal situation. Fine coal is developed in the course of current methods of coal preparation.

But, the continuation of this work is not critical to our development of the coal preparation technology such as in the advanced coal-cleaning method.

Mr. **Yates**. The appropriation for your turbine-cleaning system level is going down from $7.3 million in 1982 to $1.5 million in 1983.

Would you put in the record a list of the activities that are being deleted as a result of the reduction in this appropriation?

[The information follows:]

### TURBINE CLEANUP SYSTEMS

The following projects structured for supporting gas stream cleanup for turbine systems will not be carried out under the President's fiscal year 1983 budget request of $1.5 million.

I. Sub-pilot Scale Testing of Promising High Temperature/High Pressure (HT/HP) Particulate Removal devices to confirm concept feasibility:

General Electric's Electrocyclone—will not be tested on the Curtiss-Wright Small Gas Turbine at Woodridge, New Jersey.

A second sub-pilot scale device based on on-going fiscal year 1982 laboratory test. Candidates include: Ducon—Fixed granular bed filter; Combustion Power Co.—Screenless moving granular bed filter; Westinghouse—Ceramic cross flow filter; Air Pollution Technology—Dry plate scrubber.

General Electric's Electrostatic granular bed filter will not be proof tested on PFB combustor located at New York State University, Long Island, N.Y.

II. Laboratory Scale Projects.—Research work will be discontinued on the following projects:

Air Pollution Technology—San Diego, California, dry plate scrubber.

Westinghouse—Pittsburgh, Pennsylvania, ceramic monoloth cross flow filter.

State University of New York and Aerojet Corp., Sacramento, California—acoustic agglomeration testing.

Exxon Corp.—Linden, New Jersey, magnetically stabilized granular bed filter.

III. Alkali Control Research:

Argonne National Lab.—Development of packed bed absorber.

General Electric Corp.—Development of alkali smoke absorbent (alumino silicate) process.

Westinghouse—Identification of more active absorbents.

APT—Development of integrated alkali/particulate system.

IV. Instrumentation (development of accurate on-line alkali and particulate monitors):

Sandia National Lab.—Realtime non-disruptive particle size fraction analyzer.

Brookhaven National Lab.—Characterizing and quantifying HT/HP high particle mass density coal gas stream.

West Virginia University—Disposable integrated filter sample probe assembly.

Design and construction of self cleaning optical windows for laser particle detection instruments.

V. Applied Research for support and extension of existing particulate removal concepts, specifically;

Battelle Columbus—Research on turbulent flow in cyclones.

Denver Research Institute—Parametric evaluation of Electrostatic Precipitation.

VI. Gasification Combined Cycle HT/HP turbine cleanup correlation of PFBC cleanup to gasification cleanup requirements—the following projects were planned:

Engineering assessment of PFBC particulate and alkali cleanup to gasification.

Gasification lab/bench scale cleanup to identify limitations of applying PFBC technology to gasifiers.

Selected test of promising PFBC particulate/alkali concept at a gasifier site.

VII. A comprehensive economic/systems analysis of selected PFBC cleanup devices to provide a direct overall comparison of the advantages and disadvantages of candidate cleanup device. Economy/engineering analysis would not only have benefited associated government program planners but would have provided commercial users with the comparative benefits of the subject cleanup devices to allow a more intelligent selection for specific commerical application.

Mr. YATES. What effect will all this have on the program? Are you going to stretch out development?

Mr. MARES. I think that it will result in a stretchout of development. There are several concepts which have been funded and will be tested in 1983, including an electrostatic cyclone, a ceramic bag and a couple other concepts to be tested in a PFB gasifier test rig that we have available to us.

So there will be work, but the results will not be available as rapidly as they might otherwise have been.

Mr. YATES. Is your request for $500,000 for the process modification technology a one-time request or is that something that is likely to be repeated?

Mr. MARES. That work is to look at whether there are ways to modify the combustion processes that would reduce the $NO_x$ and $SO_x$ emissions.

We don't know whether we would want to ask for funds like that in the future, we don't know that, Mr. Chairman.

Mr. YATES. How far advanced is development of instrumentation associated in the cleanup base technology?

Mr. MARES. In the cleanup base technology, there were about four items, four elements that were funded in the past, instrumentation being one of them, and that activity, to the extent that we are going to continue, is not going to continue in that particular line item.

We have other instrumentation efforts in other programs, but we will not continue to fund instrumental work in that line.

## STRUCTURAL CERAMICS

Mr. **Yates**. Let's talk about advanced research now in technology development. What portion of the materials request of $3,940,000 is for structural ceramics?

Mr. **Mares**. I don't know. I'll provide it for the record.

[The information follows:]

The amount requested for structural ceramics is approximately $600,000.

Mr. **Yates**. What is the potential for the use of structural ceramics? How important a development is this? What importance does this research have?

Mr. **Mares**. I can't answer specifically on structural ceramics. The general answer is that ceramics have the potential to withstand higher temperatures and more corrosive adverse environments which are the sorts of conditions that almost all of the coal-based synthetic processes are struggling with.

Mr. **Yates**. Yes; for automobile engines and the turbine, they are moving to structural ceramics.

Mr. **Mares**. That's correct, there is some work done at NASA, Lewis and CE has been funding it.

Mr. **Yates**. I noticed in a research papers that there is a Japanese company which has been doing research in ceramics, and which has developed a ceramic automobile engine.

It is rather fascinating because we are looking at the ways to develop certain parts for the turbine and they are looking at an entire engine. They are way ahead in that, apparently, unless the information that was furnished to us is not accurate.

But I was rather surprised at that. I thought we would be up with them, but apparently they are ahead.

Mr. **Mares**. I am not familiar with that, but I do think that ceramics, and there has been a lot of movement in this direction for those reasons, is a significant field.

## ADVANCED INSTRUMENTATION CONTROL AND DIAGNOSTICS

Mr. **Yates**. You don't want any specific appropriation for advanced instrumentation control and diagnostics. Are you requesting funds for these in other programs?

Mr. **Mares**. There is some funding requested within the context of other specific items like combustion systems as it relates to instrumentation.

Mr. **Yates**. Did you have similar appropriations in 1981 and 1982?

Mr. **Mares**. Line items in those——

Mr. **Yates**. The same kind of appropriations? Or did you have a line item?

Mr. **Mares**. My understanding is that it was within the line items in 1982, not as a separate line item.

[Committee note.—Subsequent to the hearing, the committee was informed by DOE that it was a separate line item in 1982.]

## H-COAL PILOT PLANT

Mr. **Yates**. Has DOE taken any action to facilitate the continuation of the H-coal pilot plant operations when Government funding has been completed?

Mr. **Mares**. Well, we are trying to negotiate so that the facility will not have to be dismantled. The property is owned by Ashland. We own the facility. We are obligated to clear the site when we are finished with the facility.

Obviously, since it is one of the five finalists for the SFC, it is a process where there seems to be interest by others.

Mr. **Yates**. I understand the Japanese are looking at it. How favorably inclined has their reaction been?

Mr. **Mares**. I didn't know the Japanese were. I thought there were discussions with the Chinese, but I didn't know there were also conversations with the Japanese.

Mr. **Yates**. Yes, the Japanese are interested.

Mr. **Mares**. We are trying to negotiate our way out of the responsibility to dismantle the facility and have those funds instead be used for final testing and information.

Mr. **Yates**. Your letter, Mr. Mares, to me on January 22, on the H-coal project, says this:

> Discussions and meetings have been conducted by the joint venture with representatives of the Japanese Government concerning continued cooperation in fossil energy research and development, particularly coal liquefaction.
>
> As a result, plans are nearly finalized for a visit in February by representatives of the Ministry of International Trade and Industry. One of the prime reasons for their visit is to tour the H-coal facility in Catlettsburg, Kentucky.

Mr. **Mares**. I did not recollect that letter. There has been a mission from the Ministry that has been here. It has visited several of our facilities and would appear they have visited the H-coal facility.

Within the recent time frame, within the last month, I do not recollect any discussion regarding the possibility of the Japanese participating. But we will——

Mr. **Yates**. Who went with the Japanese to Catlettsburg?

Mr. **Mares**. One of the persons on my staff who is not present here today.

Mr. **Yates**. All right.

How much would it cost to return the plant site to its original condition if no private group wants to take over?

Mr. **Mares**. There is a variation of estimates of what termination costs might be. They range, as I recollect, from a low of about $13 million to a high of about $40 million, but five of the six or seven estimates are around $23 million.

So $23 million is the number that we are using.

Mr. **Yates**. What coals other than high-sulfur, Illinois coal have been tested at the H-coal plant?

Mr. **Mares**. We have tested, I believe, Wyodak coal.

Mr. **Yates**. That is the only type?

Mr. **Mares**. Yes, sir.

## METHANOL-TO-GASOLINE PILOT PLANT

**Mr. YATES.** What is the status of the gasoline process plant being built in Germany?

**Mr. MARES.** It is in the construction phase. The construction is proceeding on that project. We would expect in 1983 to conclude our funding for that project and that it would be completed, operated, and test work conducted.

**Mr. YATES.** Will your fiscal year 1983 request permit the pilot plant to remain on its original schedule?

**Mr. MARES.** I believe so, yes.

**Mr. YATES.** Would you place in the record the extent of cost sharing by the German Government and Mobil?

**Mr. MARES.** As I recollect, it is about a third Federal Republic of Germany, about a third us, and about a third Mobil. But we will place in the record what it is. I will not rely on my recollection.

[The information follows:]

### COST-SHARING AGREEMENT FOR THE METHANOL-TO-GASOLINE PILOT PLANT

The Methanol-To-Gasoline pilot plant project is cost shared one-third each by DOE, the Federal Republic of Germany, and an industrial consortium consisting of two German firms (URKB and Uhde) and Mobil Oil Company (the process technology developer). The estimated total cost of the project developed in 1979 was 63 million DM. The current trend estimate for the project indiciates it will probably cost about 70 million DM to complete. DOE has budgeted through fiscal year 1983 for a DOE share of $11.8 million, which is expected to cover most of the DOE share. It should be noted that if the project is commercially successful, DOE will be reimbursed up to 200 percent of its contribution to the project from future Mobil royalties according to an established formula for royalty sharing.

**Mr. YATES.** Do you expect to keep making a contribution on the basis of one-third participation?

**Mr. MARES.** We expect to be finished with our participation at the end of fiscal year 1983.

**Mr. YATES.** Then what happens? Does the financing go over 50 percent by Germany, 50 percent by Mobil? Or will the project be brought to a termination?

**Mr. MARES.** We believe that we will have received the value that we set out to receive and that the project will be successfully concluded at that stage.

It would have been carried far enough that then the process can be commercialized.

**Mr. YATES.** In your justification, you say there is a high probability that the royalty payments will exceed the Government investment.

What's the reason for that optimistic statement?

**Mr. MARES.** This is a fluidized-bed process. There is a fixed-bed process used to accomplish the same end result, namely convert methanol to gasoline.

The fixed-bed process is the subject of a contract between Mobil and the Government of New Zealand reported in the press, which will lead to a very large plant in New Zealand to convert methanol to gasoline.

The fluidized bed is a variation of a different process to the same net result. Our judgment would be that it does have the likelihood of being an improvement over the fixed bed. We would not be funding it if we didn't think it better than the fixed bed.

There have been companies in the United States which have made proposals to SFC that would use the Mobil gasoline process.

So that gives us some level of confidence that there is a reasonable chance for us initially to get value from our investment.

Mr. YATES. Why is your liquid-phase methanol unit not considered long-term generic research?

Mr. MARES. This is what we call the LaPorte, Louisiana facility, the PDU that we have chosen not to continue funding.

I think that one could say that it is long-range, high-risk research, just as we said MHD was the same.

That is to say, we cannot fund all ideas that are both long-range and high-risk.

### OTHER LIQUEFACTION FACILITIES

Mr. YATES. How many unused facilities do you have in the liquefaction area that you are going to continue to fund?

Mr. MARES. At the proof-of-concept level, the Wilsonville pilot plant is one that is handling direct liquefaction. That is the only proof-of-concept level facility that we are going to be continuing to fund in fiscal year 1983.

Mr. YATES. How much does it cost to fund it?

Mr. MARES. About $700,000 a month. As you know, that is the one that is owned by EPRI.

Mr. YATES. What is the advantage of keeping that facility?

Mr. MARES. Well, we are doing work in liquefaction on catalysts and other ideas, that will improve upon the processes which are currently potentially available.

We are thinking of the H-coal and Exxon Donor Solvent processes.

We have some ideas that we think will make those more economically attractive, more efficient, and we would like to test those at the proof-of-concept level.

Thus, it is desirable to have available facilities such as the Wilsonville facility to do that.

### PRESSURIZED FLUIDIZED BED (PFB) AND ATMOSPHERIC FLUIDIZED BED (AFB) COMBUSTION

Mr. YATES. Let's talk about combustion systems now.

What is your opinion on the readiness of commercialization of atmospheric fluidized-bed combustion as opposed to pressurized fluidized-bed combustion?

Mr. MARES. There are currently available commercial atmospheric fluidized-bed boilers and systems. I think that is something that the Office of Fossil Energy, DOE, and Congress can take pride in. We have nurtured a technology over the last 6 or 7 years from an idea stage through the commercialization stage.

Relative to pressurized fluidized bed, we are not there. We are recommending the funding in fiscal year 1983 of the Grimethorpe project. Once it is completed, we will have demonstrated PFB combustion.

Mr. YATES. What problems remain in the technology?

Mr. **Mares**. I am not sure how to answer that question. The reason I am not is that at almost any stage in the developmental process, there will be some anxieties that will exist in the operator's mind or the engineer's mind until the facility has been up and operating and I am referring to not just the first commercial plant, but several commercial plants.

In a general sense, I think there are a lot more anxieties about PFB than there are relative to AFB. There have been 20 or 30 industrial AFB facilities that already operate, one here at Georgetown University, and several other places around the country including some at a commercial sized scale.

That is not so in PFB. It is going to take longer to develop PFB and commercialize it. It is not likely to happen tomorrow.

Mr. **Yates**. What is your guess? Will industry be willing and are they capable of solving whatever problems remain without further Government support?

Mr. **Mares**. I think it is capable. There is a joint U.S. firm-foreign Government project in Sweden on the PFB concept.

I think it is possible that there will be continued work by the private sector in the area to nurture it and carry it along just as we have done in the atmospheric fluidized bed.

### COAL-WATER MIXTURES

Mr. **Yates**. Alternative fuel utilization is being reduced from $4,200,000 to $2 million. What effect will this reduction have on the coal-water mixtures projects? Will it slow the program?

Mr. **Mares**. In that case, yes, it will slow it somewhat. We have selected a couple firms to do research for us in that area as a result of a solicitation we sent out last fall.

That work will be concluded during 1983. Based on that work, as well as some that we are doing at the Pittsburgh Energy Technology Center, and from what we are learning from industry, we should have an idea how we ought to spend our money in the future.

The thing that we have to be careful of in all these technologies is not to run the rate of expenditure up very, very rapidly before we get the benefit of the previous year or years' expenditure.

Forcing money on a problem doesn't always solve it and sometimes a bit of time is more productive than just hiring more people to look at a problem.

But relative to the alternative fuels and coal-water, it is something that we ought to support. We think it has a lot of potential.

This level of funding is going to cause its development, from the technological standpoint, to be a little slower than it might otherwise have been, but we are seeing firms, private firms, that are trying to do work in that area on their own account without our funding.

So that we are not the only people investing in that area.

Mr. **Yates**. Is there private-sector research there?

Mr. **Mares**. There is some private-sector research in coal-water.

Mr. **Yates**. Will coal-water mixtures be ready for commercialization within the next few years?

Mr. **Mares**. Some people think so, others would say no, it may take as many as 3 but others think 6 to 8 years.

Mr. **Yates**. Are there any coal-oil mixtures being used today?

Mr. **Mares**. They have been used in a power plant in Florida. There are two firms commercially trying to sell coal-oil mixtures.

I don't know specifically where they are being used in an existing facility today. I have seen trade shows where two different firms were offering coal-oil mixtures for commercial sale.

Mr. **Yates**. What coal combustion research facility does the Government cite will be continued?

Mr. **Mares**. Coal combustion?

Mr. **Yates**. Combustion research facility.

Mr. **Mares**. There is the Pittsburgh Energy Technology Center.

Mr. **Yates**. That will be continued.

Mr. **Mares**. Yes, sir.

Mr. **Yates**. All right.

Mr. **Mares**. I can't remember if we are funding some others. Oh, the Sandia-Livermore is one other which is a national laboratory combustion facility. We are having work done at that facility using laser diagnostics.

Fossil energy is not the only user, it is supported by the Office of Energy Research. But that is another federally sponsored facility.

I think there is also some work at the Morgantown facility in the combustion area.

### FUEL CELLS

Mr. **Yates**. Let's turn to fuel cells now. When do you expect your Con Edison demonstration plant to be operational?

Mr. **Mares**. We hope at the end of this summer. We have had more problems than we expected in getting that up and running.

Most recently, there was a problem in the reformer there where they burned some of the reformer tubes. That delayed start-up for about 3 months.

This is to convert the hydrocarbon fuel into the hydrogen and $CO_2$ that we need for the fuel cell.

Mr. **Yates**. Will you need more money to finance the demonstration?

Mr. **Mares**. Our request for 1983 anticipated that the funds would be used for restacking the central stack. The present configuration has a 4-year old central stack and overall in terms of technology development, it is a several-year-old stack.

We were going to put a more modern stack in it. Because of the delays in getting it up and running and the most recent delays, we don't have the money in the 1983 budgets to restack, although we had hoped to complete this task when we put the budget together.

We don't have enough to restack it. We do have enough to get it started and operating in its current form.

Mr. **Yates**. What is the status of phosphoric acid fuel cells?

Mr. **Mares**. Our judgment is we are really close to where the private sector can take those through to commercialization.

Mr. **Yates**. Is the utility industry willing to purchase such fuel cells?

Mr. Mares. I think we are fairly close. We won't know for sure until we, the Federal Government, no longer are funding a significant portion of research in the fuel cell area.

We would say that the 4.8 megawatt of ConEd is a proof-of-concept test for the utility industry of phosphoric acid fuel cells.

Mr. Yates. How much money is being provided by GRI to complete the field test?

Mr. Mares. There is about $8 million in 1982 for 45 machines of 40 kilowatt size and we are putting some money in from a technology base standpoint.

The first one of those 40 kilowatts has been delivered.

We would expect the remaining 45 of them to be delivered over the next 12 to 18 months.

[Committee note.—Subsequent to the hearing DOE informed the committee that the remaining 45 machines will be delivered between June 1983 and June 1984 in accordance with a NASA agreement.]

Mr. Yates. What is the status of the molten carbonate fuel cell system?

Mr. Mares. We are continuing to fund a technology base program. We will probably have to reduce our support from two differing systems to one based upon our fiscal year 1983 budget proposal.

Mr. Yates. How does that compare in development to the phosphoric? What is your opinion?

Mr. Mares. It is a little in the eye of the beholder. We would say that it is behind the phosphoric acid by several years. I think there are some people, who are active in molten carbonate, that think they have enough advantages and desirable features to come fairly close to the phosphoric acid in terms of commercialization.

They have the technical advantage of a higher temperature outlet gas which allows you to get more energy from the system than does the phosphoric acid method.

It is an inherent technical advantage of the system.

Mr. Yates. Do you expect molten carbonate to be commercial soon?

Mr. Mares. Well, if we mean "soon," 10 years, yes, if you mean 5 years, no.

Mr. Yates. I won't ask about six or seven.

Mr. Mares. I am not smart enough to be able to pick within that, but it is not a few years.

Mr. Yates. What about the development of the solid oxide fuel cell?

Mr. Mares. That's even farther out, but also has greater potential. Again, primarily we are revolving there around the higher-system outlet temperature which allows you to get more energy out of it in more traditional ways.

The Tubular structured concept, may well offer even greater operational advantages, and economic advantages, than do the stack and plate, or plate and stack varieties of the molten carbonate and phosphoric acid.

### THERMIONIC RESEARCH

Mr. **Yates**. Do you think industry will continue to do thermionic research?

Mr. **Mares**. I don't know. Our judgment was that the results we have seen to date didn't justify continuing to fund it. We are not clairvoyant or perfect in our judgments.

It is possible that an industrial firm might decide to do work in the area because they think there is a particular advantage to it.

### COST SHARING IN FUEL CELL DEVELOPMENT

Mr. **Yates**. To what extent is cost sharing being done by the industrial developers in fuel cell technology? Is there much cost sharing?

Mr. **Mares**. There is, I think, a national program in the development of fuel cells which was initiated 2 or 3 years ago and contemplated industrial expenditures, GRI expenditures, and EPRI expenditures.

The exact split between all those players and the Department of Energy, I don't have at my fingertips, but there has been, at least in GRI, some increased expenditure level over the last 12 months.

How much increase we have seen to date in the private sector, in our industries, is unclear as of this instance to me.

Mr. **Yates**. Is there any cost sharing by the fuel cell users group?

Mr. **Mares**. I am told that overall, the expenditure to date on the research side has been about 80 percent private industry and about 20 percent DOE.

### FOREIGN COMPETITION IN FUEL CELLS

Mr. **Yates**. Is there significant foreign competition in the fuel cell field?

Mr. **Mares**. There is substantial interest in the development of fuel cells. We believe there is significant interest in Japan in developing fuel cell technology. We believe that some of the American firms as they have seen the level of expenditure funding from the Federal Government reduced have tried to develop licensing or other relationships with some Japanese firms in order to get additional funding, either to continue work here, or at least to give the American firms some return for the effort that they have made to date.

We have tried to encourage some interest in at least acquiring fuel cells in Europe through a couple of workshops or seminars we have had in Western Europe describing the status of fuel cell development in this country. But I think the greatest governmental interest appears to be by the Japanese Government.

Mr. **Yates**. Do you have any results from your feasibility study of diesel engines operating on coal water slurry?

Mr. **Mares**. To the extent we have results—we can say we are continuing to do that work.

### GREAT PLAINS

Mr. **Yates**. Let's turn to the Great Plains gasification plant. What is the status of that?

Mr. **Mares**. The Great Plains project is proceeding so far on time, on budget.

Mr. **Yates**. When do you expect the facility to be completed?

Mr. **Mares**. The current schedule is to start up the first train in the summer of 1984, and start up the second train in the winter of 1985, early winter, 6 months later.

Mr. **Yates**. Do you have any way of knowing how many of the components of the plant will be made in the United States?

Mr. **Mares**. I do not know that information, no, sir.

Mr. **Yates**. When the plant is finished, what is your guess as to how the price of the Great Plains gas will compare to the cost of Alaskan gas?

Mr. **Mares**. A lot depends on what year you are going to use as your assumption point, and what interest rates you are going to use for your assumption points.

Mr. **Yates**. Pick your year and your interest rates.

Mr. **Mares**. I believe that the last estimates that I saw would indicate that the cost of gas from the Great Plains project would be less than the cost of gas from Alaska. But I would rather not totally rely on my recollection in that regard, and answer that one for the record.

[The information follows:]

## PRODUCT COST COMPARISON BETWEEN ALASKA-CANADA NATURAL GAS PROJECT AND THE GREAT PLAINS GASIFICATION PROJECT

Reliable cost estimates for gas from the Alaska-Canada natural gas pipeline are not currently available. On April 30, 1982, sponsors of the Alaska-Canada natural gas pipeline announced that completion of the project will be delayed at least another two years until 1989. Officials for Northwest Energy Co., principal U.S. sponsor of the 4,800-mile pipeline, had no estimate of how much the delay would add to the cost of the project.

The product cost estimates for the Great Plains Gasification Project were assessed in great detail. The key factors were construction costs and project operations. The latter factor included a study of operating costs, utilization rates, gas prices and revenues. A sensitivity analysis was performed which examined the project's economic viability under a range of plausible construction and operating scenarios. Table I (attached) presents the Cash Flow Analysis for the American Natural Gas Control Case, which included estimates of escalation for operation and maintenance costs of 5.5% per year, for coal costs of 7.3% per year, for debt expense of 11 [illegible] and for revenues of 7.9% per year after 1995.

It is possible to estimate the cost of synthetic gas produced by taking the value of total expenses for a given year, and dividing it by the assumed production rate for the year.

The plant has been estimated to achieve its steady-state operational on-stream production level of 125 million cubic feet per day of synthetic gas with a heat content of 977 Btu's per cubic foot during the fourth year of operation (1988). The estimated cost per cubic foot of synthetic gas for the year 1988 is:

$$\$/FT^3 \ 1988 = \frac{507,600,000}{125,000,000 \times 365} = \$.01125$$

For the year 1995 the estimated cost is:

$$S/FT^3 \ 1995 = \frac{542,900,000}{125,000,000 \times 365} = \$.01189$$

Estimates for other years after 1988 may be computed in the same manner.

Mr. YATES. Do you have any resources for overseeing the Great Plains loan guarantee?

Mr. MARES. Yes, sir, we do. We do not request funds in 1983 because we have carry-over funds in 1982 that we will be spending to allow us to monitor that project. We are monitoring the project with people from our ETC's, headquarters and operations office. We participate in periodic management meetings in that project to allow us to better follow the results of the project as well as getting a full series of reports. There is a fee that is paid by the Great Plains associates for the money that they have borrowed through the Federal Financing Bank, and a portion of that fee was designed to cover the monitoring expenses.

But we would expect to be requesting authorization and appropriation of funds as needed to allow us to continue to monitor that project.

Mr. YATES. What happens to the money you get by way of that fee? Does it go to you, or to the Treasury?

Mr. MARES. I believe that it goes to the Energy Security Reserve, the 1 percent fee, where it could be appropriated by Congress for use in administering the guarantee.

Mr. YATES. Do you have any authority to use this fee to monitor the project?

Mr. MARES. I do not think we have authority without further Congressional direction, no, sir.

Mr. YATES. Of what use is the gasifier at Grand Forks Energy Technology Center in the development of the Great Plains project, any at all?

Mr. MARES. It is a fixed bed slagging Lurgi type gasifier which is obviously smaller than the gasifiers being put in at Great Plains. We are operating it this year to obtain really some effluent streams upon which we plan to do environmental testing.

The Great Plains gasifier is really a fixed bed non-slagging commercial gasifier It has been operating for many, many years, and we would not expect that you would need the Grand Forks gasifier as a prerequisite to sensibly operating the Great Plains project.

Mr. YATES. Is the Union oil shale project on schedule?

Mr. MARES. To the best of my knowledge it is.

Mr. YATES. Tosco is not?

Mr. MARES. Correct.

Mr. YATES. Nor is Exxon's.

Mr. MARES. Correct.

## IN-SITU GASIFICATION

Mr. YATES. What about in-situ gasification of coal, is that near or far away from commercialization?

Mr. MARES. Our judgment is that we have taken that to a stage where the private sector can evaluate it, and make the judgment to proceed.

Mr. YATES. Do you know of any companies that are going to move forward with it?

Mr. MARES. At such time as they determine there is a market need for that type of resource, a medium-Btu gas or low-Btu gas, then they would proceed. I think the tests we have just completed in late last calendar year in Wyoming was quite successful as a demonstration of gasifying and making a medium-Btu gas from a coal bed.

Mr. YATES. You do not know of any companies who are going forward?

Mr. MARES. Within the United States, that is correct.

Mr. YATES. What about in-situ gasification? Is it more likely to occur in western coals, or eastern coals?

Mr. MARES. I would say where the market need is the strongest.

Mr. YATES. Is it stronger in the West or in the East?

Mr. MARES. I do not presume to know.

Mr. YATES. Have you discovered any adverse environmental impacts so far from the in-situ gasification project?

Mr. MARES. Not that I am aware of that would cause people to refuse to continue to follow the project. The request we made for fiscal year 1983 is to continue to conduct environmental monitoring of the test areas where we had conducted tests in the past.

It was not because of anything we had learned that said there would be a problem. It was a request from the State, I guess, because we did not know what might happen.

## MAGNETOHYDRODYNAMICS

Mr. YATES. Let's turn to magnetohydrodynamics. How long have the Montana and Tennessee facilities been operational?

Mr. MARES. I think the Montana facility would claim that they started full operation, at least in their current mode, in February of this year. And the Tennessee operation was in late last year. Not fiscal year. Like December, 1981, for Tennessee and February, 1982 for Montana.

[COMMITTEE NOTE.—Subsequent to the hearing, DOE provided the following:]

The Montana facility completed its official facility test demonstration in February 1982. This marked DOE acceptance that the facility was fully prepared to execute the tests requested using test train 1A1. Tullahoma has provided most interesting and valuable data but has yet to complete the planned facility test demonstration. In an April 30 check-out, the facility was operated at full rated power on-coal. This will be repeated in the near future as part of the formal acceptance.

Mr. YATES. Have the initial tests at Butte demonstrated anything of significance?

Mr. MARES. The equipment and facilities that they were seeking to test did meet the goals of the test, yes, sir.

Mr. YATES. Would you put in the record what the goals of the tests were?

[The information follows:]

### MHD BUTTE GOALS

The initial fiscal year 1982 results at CDIF, Butte, Montana were as follows:

Goal: Perform the facility test demonstration (FTD) which constitutes the official DOE acceptance of the facility for performing the test program.

Schedule: February 1982.

Results: Sucessfully completed FTD on February 10, 1982.

Goal: Characterize the performance of the AVCO supersonic channel (Test train 1A1).

Schedule: Fiscal year 1982 activity.

Results: Generated increasing amounts of net power from MHD channel operation: 1.0 MWe (Feb. 10, 1982), 1.5 MWe (Feb. 26, 1982).

Goal: Achieve nominal channel power.

Schedule: September 1982.

Results: On March 18, 1982, achieved power of 2.27 MWe, well in excess of nominal power. Work continues on optimization of performance.

Goal: Install EPRI inverter and provide power from MHD channel to commercial power grid.

Schedule: September 1982.

Results: Completed installation and initiated testing. Provided 400 KWe to Montana Power Company grid on April 23, 1982.

Goal: Checkout coal preparation system in advance of receipt of coal-fired combustor for future MHD channel tests with coal.

Schedule: April, 1982.

Results: First shipment of coal to TRW for combustor checkout was made on April 30, 1982. Work continues on coal preparation and delivery system.

Mr. YATES. Over what period of time do these facilities have to be operated in order to make them meaningful?

Mr. MARES. A lot depends on what you mean by meaningful. If there was a judgment that we must go to the next step of a proof-of-concept engineering test facility, then these facilities should operate for some period of time, in order to test some of the components and some of the systems at the level for which they are designed, which is about a fifth the level in a full system, the level that is being contemplated.

Since we have made a judgment in the recommendation that it is too costly relative to the value to continue to conduct such a program, I have not scoped out how many years each of these facilities ought to continue to operate.

Mr. YATES. How much of a delay in the MHD program occurred?

Mr. MARES. We were spending money on a month by month basis at the appropriate amount.

Mr. YATES. So there was no delay caused by it then?

Mr. MARES. No formal delay. I am sure there were some anxieties that we were funding at the appropriate rate.

Mr. YATES. Would there have to be any international agreements cancelled if MHD were terminated?

Mr. MARES. The agreement we have with the Soviet Union whereby a magnet was sent to the Soviet Union for testing in an MHD facility might have to be cancelled. We are trying to determine how to terminate that agreement and recover the magnet from them.

Mr. YATES. When do you expect a decision on the magnet? You said you are trying to determine.

Mr. MARES. I would rather not hazard a guess until I have inquired, and then respond, sir.

Mr. YATES. Put that in the record.

[The information follows:]

### MHD MAGNET

Under Administration guidelines, all US/USSR MHD cooperative activities have been indefinitely postponed, and the U.S. does not plan to renew the joint Energy Agreement (which includes MHD) when it expires this June. The U.S. magnet loan agreement calls for the magnet to remain in the USSR for joint MHD generator tests until the cooperation is terminated. Therefore, we are now developing plans for return of the magnet shortly after the program is terminated.

## CASH FLOW ANALYSIS - ANC CONTROL CASE

| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenues: | | | | | | | | | | | |
| Gas Sales | 352.1 | 421.8 | 499.0 | 585.5 | 633.4 | 685.1 | 740.0 | 798.7 | 862.1 | 930.5 | 1004.3 |
| Pipeline | 28.4 | 27.3 | 26.1 | 25.0 | 23.9 | 22.7 | 21.6 | 20.4 | 19.3 | 18.2 | 17.0 |
| Interest | | | | | | | | | | | |
| Total Revenues | 380.5 | 449.1 | 525.1 | 610.5 | 657.3 | 707.8 | 761.6 | 819.1 | 881.4 | 948.7 | 1021.3 |
| Expenses: | | | | | | | | | | | |
| O&M | 125.9 | 132.6 | 139.8 | 147.1 | 155.0 | 163.3 | 172.0 | 181.3 | 191.0 | 201.5 | 212.6 |
| Coal | 52.1 | 59.4 | 71.9 | 77.2 | 82.8 | 88.8 | 95.1 | 102.0 | 109.4 | 117.2 | 125.7 |
| Ad Valorem Tax | 8.8 | 10.5 | 12.5 | 14.6 | 15.8 | 17.1 | 18.5 | 20.0 | 21.6 | 23.3 | 25.1 |
| Interest | 193.1 | 193.1 | 193.1 | 188.1 | 178.2 | 163.4 | 161.2 | 145.1 | 128.9 | 112.8 | 96.7 |
| Deprec.(plant+pipeline) | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 |
| Mine Depreciation | 7.8 | 10.1 | 10.6 | 11.8 | 11.8 | 12.6 | 12.7 | 13.0 | 13.5 | 13.6 | 14.0 |
| Total Expenses | 456.5 | 474.5 | 496.7 | 507.6 | 512.4 | 514.0 | 528.3 | 530.2 | 533.2 | 537.2 | 542.9 |
| Net Income | (76.0) | (25.4) | 28.4 | 102.9 | 144.9 | 193.8 | 233.3 | 288.9 | 348.2 | 411.5 | 478.4 |
| +Deprec.(plant+pipeline) | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 |
| -Capital Expenditures | 13.6 | 23.8 | 10.4 | 5.9 | 9.5 | 16.4 | 14.5 | 11.5 | 10.5 | 8.1 | 16.0 |
| -Debt Repayment | 0* | 0 | 0 | 42.1 | 84.3 | 126.4 | 126.4 | 126.4 | 126.4 | 126.4 | 126.4 |
| Net B.T. Cash Flow | (20.8) | 19.6 | 86.8 | 123.7 | 119.9 | 119.8 | 161.2 | 219.8 | 280.1 | 345.8 | 404.8 |
| Partner Loans | 20.8 | (19.6) | (1.2) | - | - | - | - | - | - | - | - |
| Cash Flow Available For: | | | | | | | | | | | |
| Escrow | | | | 84.3 | 42.1 | | | | | | |
| Debt Protection Fund | | | 85.6 | 39.4 | 77.8 | 4.2 | (8.0) | (8.1) | (8.1) | (8.0) | (8.1) |
| Retention | | | | | | | | | | 156.4 | 202.4 |
| Distribution | | | | | | 115.6 | 161.2 | 219.8 | 280.1 | 189.4 | 202.4 |
| After Tax Benefits to Parents | | | | | | | | | | | |
| Loans (From) Parents | (20.8) | 19.6 | 1.2 | - | - | - | 8.0 | 8.1 | 8.1 | 8.0 | 8.1 |
| Distributions | 0 | 0 | 0 | 0 | 0 | 115.6 | 161.2 | 219.8 | 280.1 | 189.4 | 202.4 |
| Taxes Payable (46%) | (93.7) | (60.7) | (31.0) | 8.1 | 32.4 | 59.7 | 82.8 | 113.3 | 145.5 | 179.4 | 215.1 |
| After Tax Cash Flow to Parents | 72.9 | 80.3 | 32.2 | (8.1) | (32.4) | 55.9 | 86.4 | 114.6 | 142.7 | 18 | (4.6) |
| A.T. Cash Flow | | | | | | | | | | | |
| Including Loanable Amounts | 72.9 | 80.3 | 117.8 | 115.6 | 87.5 | 60.1 | 86.4 | 114.6 | 142.7 | 174.4 | 197.8 |
| Beginning Equity | 539.8 | 463.8 | 438.4 | 466.8 | 569.7 | 714.6 | 792.8 | 864.9 | 934.0 | 1002.1 | 1224.7 |
| Partnership Net Income | (76.0) | (25.4) | 28.4 | 102.9 | 144.9 | 193.8 | 233.3 | 288.9 | 348.2 | 411.5 | 478.4 |
| Distributions | 0 | 0 | 0 | 0 | 0 | 115.6 | 161.2 | 219.8 | 280.1 | 189.4 | 202.4 |
| Ending Equity | 463.8 | 438.4 | 466.8 | 569.7 | 714.6 | 792.8 | 864.9 | 934.0 | 1002.1 | 1224.2 | 1500.2 |
| Debt Outstanding - End Pd. | 1643.3 | 1643.3 | 1643.3 | 1601.2 | 1516.9 | 1390.5 | 1264.1 | 1137.7 | 1011.3 | 884.9 | 758.5 |

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CASH FLOW ANALYSIS - ANG CONTROL CASE

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Revenues: | | | | | |
| Gas Sales | 1083.6 | 1169.2 | 1261.6 | 1361.2 | 1468.8 |
| Pipeline | 15.9 | 14.7 | 13.6 | 12.5 | 11.3 |
| Interest | | | | | |
| Total Revenues | 1099.5 | 1183.9 | 1275.2 | 1373.7 | 1480.1 |
| Expenses: | | | | | |
| O&M | 224.3 | 236.6 | 249.6 | 263.4 | 277.9 |
| Coal | 134.9 | 144.7 | 155.3 | 166.6 | 178.8 |
| Ad Valorem Tax | 27.1 | 29.2 | 31.5 | 34.0 | 36.7 |
| Interest | 80.6 | 64.5 | 48.4 | 32.2 | 16.1 |
| Deprec.(plant+pipeline) | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 |
| Mine Depreciation | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| Total Expenses | 547.7 | 555.8 | 565.6 | 577.0 | 590.3 |
| Net Income | 551.8 | 628.1 | 709.6 | 796.7 | 889.8 |
| +Deprec.(plant+pipeline) | 68.8 | 68.8 | 68.8 | 68.8 | 68.8 |
| -Capital Expenditures | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 |
| -Debt Repayment | 126.4 | 126.4 | 126.4 | 126.4 | 126.4 |
| Net B.T. Cash Flow | 481.5 | 557.8 | 639.3 | 726.4 | 819.5 |
| Partner Loans | - | - | - | - | - |
| Cash Flow Available For: | | | | | |
| Escrow | | | | | |
| Debt Protection Fund | (8.0) | (8.1) | (8.1) | (8.0) | (8.0) |
| Retention | 240.7 | 278.9 | 319.6 | 363.2 | 409.7 |
| Distribution | 240.8 | 278.9 | 319.7 | 363.2 | 409.8 |
| After Tax Benefits to Parents | | | | | |
| Loans (From) Parents | 8.0 | 8.1 | 8.1 | 8.0 | 8.0 |
| Distributions | 240.8 | 278.9 | 319.7 | 363.2 | 409.8 |
| Taxes Payable (46%) | 253.7 | 293.7 | 326.1 | 381.0 | 428.8 |
| After Tax Cash Flow to Parents | (4.9) | (6.7) | (8.3) | (9.8) | (11.0) |
| A.T. Cash Flow | | | | | |
| Including Loanable Amounts | 235.8 | 272.2 | 311.3 | 353.4 | 398.7 |
| Beginning Equity | 1500.2 | 1811.2 | 2160.4 | 2550.3 | 2983.8 |
| Partnership Net Income | 551.8 | 628.1 | 709.6 | 796.7 | 889.8 |
| Distributions | 240.8 | 278.9 | 319.7 | 363.8 | 409.8 |
| Ending Equity | 1811.2 | 2160.4 | 2550.3 | 2983.8 | 3463.8 |
| Debt Outstanding - End Pd. | 632.1 | 505.7 | 379.3 | 252.9 | 126.5 |

[COMMITTEE NOTE.—Subsequent to the hearing, DOE informed the committee that agreements with Poland and the Netherlands would also be affected if MHD were terminated.]

Mr. YATES. Is the utility industry interested in MHD technology at this point?

Mr. MARES. I suspect the answer is as long as the Federal Government funds it, yes. If they fund it, the answer at this literal minimum is no. Now they will say they might participate in some of these farther out stages, but that remains to be seen.

### MINING R. & D.

Mr. YATES. You want a million dollars for mining research and development.

Mr. MARES. Yes, sir.

Mr. YATES. What will that let you do?

Mr. MARES. That will let us continue to operate, at a modest level, the in-house work we are doing at the Pittsburgh Mining Center involving the longwall coalminer. The thing that we hope will happen, and expect to happen, is that the program will be transferred to the Department of the Interior. In fact, we hope it will happen within this fiscal year.

In order to do that, our understanding is that some form of legislation will be needed. There was language in the 1982 conference report recommending that this transfer take place. We and the Department of the Interior both want it to take place. And we hope we will be able to present a legislative proposal to you well within this fiscal year so as to transfer it this year.

As the Department of Interior picks up the monitoring and management of the mining R&D program, the possible termination of outstanding contracts should provide more funding for them as they develop their 1983 program. It should certainly provide more funding for them than the $1 million we have asked for in our budgetary request.

Mr. YATES. Has your mining R&D program accelerated longwall mining in the United States?

Mr. MARES. Well, that is its goal. Whether it has or has not, I do not know. I mean the goal is to do research and develop the technology base as it relates to the use of longwall mining techniques.

Mr. YATES. What is the current status of the Carbondale Mining Technology Center?

Mr. MARES. We are trying to transfer that facility to Southern Illinois University. I think as of this instance, one of the things we are trying to understand and be sensitive to is the revisions under way in the GSA process to dispose of the facilities. I understand these new provisions are to basically seek the highest bidder. We are trying to be sure that the GSA process does not disrupt what both Congress and the Department clearly want, namely transfer of the facility to Southern Illinois University.

Mr. YATES. You do not want any funds for R&D of productivity increases in surface mining; at least you are requesting none.

Mr. MARES. Correct.

Mr. YATES. Is it reasonable to do away with this kind of research?

Mr. **Mares**. We think it is, yes, sir.

Mr. **Yates**. Why is that?

Mr. **Mares**. We think the Government has taken the technology to a level where it can be picked up by the private sector and implemented more effectively. This includes the mining program at Southern Illinois University. This program is very active in the area of technical improvements relating to the coal industry.

### PEAT RESEARCH

Mr. **Yates**. Let's talk about peat research. If you are at a zero funding level for peat research, is there any incentive for industry to pick it up and commercialize the use of peat?

Mr. **Mares**. Sir, there is an incentive in the private sector always, without Government funding, to do research in order to make a profit. That is the way most research is done in this country. And, as I recollect, one of the five finalists of the SFC was a peat-based indirect liquefaction project.

So I think that ought to demonstrate at least that there is some entrepreneur that thinks we have enough technology base to proceed.

Mr. **Yates**. What is the status of the Hygas peat pilot plant?

Mr. **Mares**. The work on that was successfully completed in March. All the tests we set out to do have been done. The Institute of Gas Technology has indicated that they would like to acquire the facility from us instead of our dismantling the facility.

We would——

Mr. **Yates**. Who wants to do that?

Mr. **Mares**. The Institute of Gas Research, IGT, at which the facility is located and who did the work for us. We are favorably disposed to transferring the facility to them instead of trying to have it dismantled.

Mr. **Yates**. Is there any interest in development of the atmospheric entrained bed slagging gasifier in Windsor, Connecticut?

Mr. **Mares**. No, sir. On that, our judgment is that we have concluded the tests that were required that we set out to do. Proved the concept, or at least provided the information from which people could make economic decisions as to whether to proceed with that type of process or not, and that there really is no need for us to continue to fund operation of that facility.

Mr. **Yates**. What is going to happen to the facility?

Mr. **Mares**. I think ultimately the facility will be taken down. But that is what happens to every pilot plant. Whenever you design a pilot plant, you design it to operate not for 20 years but for a relatively few years, 3 or 4 years operation, to prove or test the ideas that you have in mind. Then it is to be abandoned or taken down and something else put in its place.

That is a case in point on this one, it has operated quite a few years, it has provided the information that we set out to obtain, and now it is no longer appropriate for us to continue to fund the operation of the facility.

### WESTINGHOUSE FLUIDIZED-BED PILOT PLANT

Mr. Yates. What about the status of the Westinghouse agglomerating fluidized-bed gasifier development?

Mr. Mares. Well, we had sought to terminate within fiscal year 1982 our continued support of that project. It is one of those within our request for deferral, which has been rejected by the House.

Concerning the Westinghouse gasifier process, they are actively trying to obtain commercial orders and—or demonstrations, I should say is more accurate, of that process in environments where the output could be used by the firm at the facility site.

As a result of the rejection of the deferral, we will be continuing to fund that gasifier test program during fiscal year 1982. We have not requested funds in fiscal year 1983 on the grounds that the Westinghouse gasifier is sufficiently far along that the private sector, specifically Westinghouse, will be able to use the facility for commercialization of that process.

Mr. Yates. Has Westinghouse made a financial contribution to the develpment of the process?

Mr. Mares. They have to some extent. I do not remember offhand.

Mr. Yates. If I remember, had Westinghouse not made a very significant financial contribution to this process?

Mr. Mares. They may have. I just do not remember, sir.

Mr. Yates. I thought they invested something like $60 million in the process.

Mr. Mares. No, sir. I think that is more the total.

Mr. Yates. Were we in on this process from the start with our financial contributions?

Mr. Mares. Yes, sir.

Mr. Yates. Here is a letter dated April 29, 1982, signed by John A. Gruver, Manager of Government Programs, Westinghouse, written to the committee. It may go into the record at this point.

[The information follows:]

**Westinghouse**
**Electric Corporation**

1801 K Street N W
Washington D C 20006

April 29, 1982

Subcommittee on Interior
Committee on Appropriations
House of Representatives
Washington, D.C. 20515

Attention: Mr. Neal Sigmon

Dear Neal:

As follow-up to our discussions this morning, attached is a breakdown of prior and planned expenditures on the Westinghouse synthetic fuels development program at Waltz Mill, Pa. It shows the amounts in millions of both Government and private sector investment for the three main areas of interest.

The Gas Research Institute is our prime partner in the continuing development of the Process Development Unit, which I might add, is the technical foundation of all our gasifier/ synthetic fuels efforts. Mr. Dave Webb will provide you with the details of GRI prior and planned levels of support.

It can be seen from this information that while the government's investment in this worthwhile program has been about 5 to 3 ($55.6 to $33.8M) in prior years by the end of 1982 the cumulative investment will be nearly equal ($66 to $63M) and by 1986 will be $224.5M to $86M by the Government, assuming the Government will continue support at $5M per year through FY'86. In 1982 in the Process Development Unit alone, the investment by the private sector will be $9.4M to the Government's $6.5M.

It was indeed a pleasure to have an opportunity to get acquainted this morning. I look forward to providing you with a more extensive overview of Westinghouse energy technology development programs that are under the cognizance of the Subcommittee on Interior Appropriations.

Sincerely,

John A. Gruver
Manager
Government Programs

Attachment

MICROFILMED FROM
BEST AVAILABLE COPY

Mr. YATES. To what extent will the Government benefit from the eventual licensing of this process?

Mr. MARES. I think that is still in negotiation, sir. If it is, then it is just inappropriate for me to answer that in public. But we are seeking, we, the Government, are seeking to obtain revenues as a result of the licensing of that project, recognizing that our financial participation in the development of that process was very substantial.

Our, the Government's, was very substantial.

Mr. YATES. What is the potential value of the gasifier at Morgantown for environmental characterization and effluent treatment?

Mr. MARES. It can be used for that. It is not the only place that we can do such work. There are other gasifiers that we do have access to wherein that work can be done, one of which is at GE.

Mr. YATES. Are there other places? Or will you settle for GE?

Mr. MARES. Right now since I cannot think of anything else, I will settle for one. Better one than none.

But again, concerning the Morgantown gasifier, that deferral was turned down, so that we will continue to operate that gasifier through fiscal year 1982.

## PETROLEUM AND GAS TECHNOLOGIES

Mr. YATES. Under petroleum technology, why do you continue an oil program and discontinue the gas program?

Mr. MARES. The gas program that we had had three elements, two of which we think were essentially completed. These were the methane from coalbed and eastern devonian shale. We think our role in the case of devonian shale is identifying the resource, providing the information and supporting some testing work, this effort should be adequate to allow the private sector to proceed in the development of that resource.

In the case of methane from coalbeds, we have done some characterization and some testing in the past. I think we have identified enough that people can proceed. In fact, within the past 2 months, there has been some publicity given to the situation in Alabama where I believe U.S. Steel has 23 wells in one of the coal seams from which they are drawing methane that they are using in one of their process plants.

The third ingredient in the program today has been the western tight sands. Those sands are what they call lenses as contrasted from blanket sands. Our work has been focused on the lenses. Now the blankets gradually peter out and become lenses. So there is a continuum of structures, a variety of structures, as you go through blanket sands to lenses.

There is an increasing amount of private sector investment and drilling in this type of western blanket sands. We helped develop some of the technology in terms of the massive fracture technologies. The oil and gas publication 2 weeks ago had an interesting article on this subject.

Our view is that with the incentives we have in the marketplace due to the rapidly rising price of natural gas, that technology can grow and evolve as people look, not just at blanket sands, but gradually going in the direction of lenticular sands. This should be particularly true for difficult to obtain gas from tight sands, as well as the technology being developed in the blanket sands.

We will be concluding two experiments with the lenticular sands this year including collecting information to test various types of logging to characterize and identify the location of these lenses, as well as some cracking technologies so we can get a better sense of the technology.

So in the gas area, between marketplace incentives and the way the technology is going, we can, with reasonable confidence, request no funding for an unconventional gas program in fiscal year 1983.

Mr. YATES. Why two wells instead of three? I thought you had a three-well test?

Mr. MARES. There was a third well that was originally contemplated. What we are saying is that we hope we will be able to obtain private sector firms or groups of firms to participate and help us fund and test using the third well of the three-well sequence.

As of this moment, we do not have a private sector consortium to do that. But that is what we hope to be able to cause to happen.

Mr. YATES. Well, good luck. I know in the U.S. Department of Energy Office of Fossil Energy Report, October 1981, page 4, it says: "The multi-well test is an activity not likely to be financed by the private sector because of the high technical and financial risks, but from it will come the technology base from which commercial acivities can be undertaken."

Mr. MARES. Necessity is the mother of invention frequently, and we hope to be able to persuade people that it makes sense to proceed.

Mr. YATES. That is also true of responding at congressional hearings.

### USE OF MICROBES FOR ENHANCED OIL RECOVERY

How far advanced is the use of microbes for enhanced oil recovery?

Mr. MARES. It is at the university laboratory stage. We are not yet to the stage of considering field tests. So far, the work in the university laboratories is exciting enough and promising enough that we want to continue to fund it.

Mr. YATES. How much of your $3 million for enhanced oil recovery is for the microbe research?

Mr. MARES. I would guess it is about $400,000. But I would prefer to provide it for the record.

[The information follows:]

#### MICROBIAL RESEARCH

The fiscal year 1983 microbial research program is funded at a $400,000 level for the laboratory microbial study to determine viable microbes as an EOR technique; i.e., in situ viscosity reduction, gas generation, and/or biosurfactant and biopolymer generation.

## ENHANCED OIL RECOVERY

Mr. **Yates**. What is your guess as to the amount of enhanced oil recovery in the United States, in barrels per day, if you have it, at the present time.

Mr. **Mares**. Well, I think there is about 800,000 of thermal and probably—steam driven. And I am going to exclude water driven and gas driven. And there is probably less, well, there is less than 50,000 I would guess in the chemical.

Mr. **Yates**. What is the potential?

Mr. **Mares**. Well, the potential is very substantial, which is again one of the reasons we want to continue the funding. The proven reserves today are around 27 billion and the discovered, but not produced, about, I do not know, 250 billion. We have taken a third of it, the original oil in place.

So probably the original oil in place might have been 400 billion barrels. We are trying to increase the average recovery from around 30 percent to something higher. There have been some rather striking cases.

A couple cases in the thermal area have gotten, as I recollect, recoveries of over 50 percent. A paper delivered at the Enhanced Oil Recovery Conference in Tulsa about a month ago, indicated that a field in one of the incentive programs had a recovery of between 50 and 60 percent.

I am sorry, I do not remember whether that was a polymer flood. I think that was a polymer flood. I do not think that was a $CO_2$ flood.

Mr. **Yates**. How extensive is industry involvement in this research? Substantial?

Mr. **Mares**. There are a large number of field projects that were spawned by the incentives program, and measured in terms of cost of the project in billions of dollars. One of the things that we are doing is obtaining data from those projects and analyzing the results to allow us to develop mathematical models and computer based models that can be used to screen other reservoirs. This information hopefully will help the operator of other reservoirs to determine, on a preliminary basis, what type of enhanced oil recovery process might be the most attractive and applicable for that particular resource.

## ARCTIC AND OFFSHORE PROGRAM

Mr. **Yates**. Let's talk of your arctic and offshore program. Are there funds in your budget for that program?

Mr. **Mares**. There is not likely to be any significant arctic and offshore program in 1983.

Mr. **Yates**. Is there likely to be one next year?

Mr. **Mares**. I said fiscal year 1983.

Mr. **Yates**. No, I mean in 1984.

Mr. **Mares**. The 1984 budget has not yet been developed, sir.

Mr. **Yates**. What kind of a program was originally envisioned for the arctic and offshore areas?

Mr. **Mares**. Well, there had not been a detailed program developed. There had been two workshops, one I think in January 1981, and one later in the year. The National Petroleum Council also did a review of the potential and the issues related to the production of oil and gas in the arctic and polar offshore areas.

From those two workshops and studies, we would have developed a program if the judgment had been made that it was appropriate or desirable for us to do so. The judgment was that there are incentives that do exist for work to be done in that area by the firms that are already active in that area; therefore, it was not deemed appropriate for us to try to develop a program ourselves.

### DOWN HOLE STEAM GENERATOR

Mr. **Yates**. What about the Sandia Laboratory and your work on the down hole steam generator test? Will all the work be completed in fiscal year 1982?

Mr. **Mares**. Yes, sir, all the work, we think is necessary. I think there, again, the Congress and the Department can take pride in an idea which has been nurtured and now is commercial. I saw it again, two different——

Mr. **Yates**. Is industry going to take it over?

Mr. **Mares**. Well, when I was at the symposium in Tulsa there were at least two different firms that had down hole steam generators that they were trying to market commercially. We plan to use the one we helped develop to conduct some tests at Long Beach, and hope to move it to Canada for another set of tests.

### MICELLAR-POLYMER PROCESS

Mr. **Yates**. How far from commercialization is your micellar-polymer process?

Mr. **Mares**. I do not know how to answer that question.

Mr. **Yates**. Do you want to think about it and put it in the record?

Mr. **Mares**. I am not even sure if we think about it and put it in the record that it is that answerable——

Mr. **Yates**. Well, the answer then is, you do not really know.

Mr. **Mares**. It has been used in several fields in the program. We are continuing to do work trying to understand the reservoir characteristics and how the micellar process would work. It is not nearly as well understood as water flooding, for instance. But from what we do know, it is one that has a fair amount of promise and it is one we want to continue to fund for research in that area.

Mr. **Yates**. How much in your budget is for that purpose?

Mr. **Mares**. Specifically for micellar-polymer? I will have to answer that for the record.

Mr. **Yates**. Would you also place in the record the comparable figure for 1982?

[The information follows:]

### Enhanced Oil Recovery—Micellar Polymer Process

The micellar polymer process can be applied commercially only to a relatively few good candidate reservoirs where extensive pilot testing and reservoir description work has been done. Thus, only two semi-commercial applications in the U.S. are underway with both cost-shared by DOE. The larger one, which is quite successful, is operated by Marathon in the Robinson Field in Illinois and the second is operated by Conoco in the Big Muddy Field in Wyoming. Many pilot development tests are underway privately or in the incentive plan. The miscellar polymer process needs additional research, development and field testing to improve chemical efficiency and reduce costs.

The DOE/FE funding for chemical flooding, mainly for the micellar polymer process, is $3.1 million in fiscal year 1982 and $3.2 million in fiscal year 1983.

### TAR SANDS

Mr. YATES. You have no request for tar sands development.

Mr. MARES. Correct.

Mr. YATES. Are there any active tar sands projects in the U.S. now?

Mr. MARES. We are concluding a tar sand test in fiscal year 1982. Our technology in fiscal year 1983 is going to be looking at heavy oil and at light oil. Some of our work in heavy oil is applicable to the problems related to tar oil, tar sands. The resource in tar sands is not as large as the resource of heavy oil or as light oil.

So as we tried to decide where we are going to focus our effort, we have tried to focus our efforts on areas where we have a larger relative resource.

Also, we know that the work in heavy oil will ultimately be translatable in the tar sands area.

Mr. YATES. If you did not have the fiscal constraints that you have in this budget, would you be doing research work on tar sands?

Mr. MARES. I suspect a relatively small amount, if any.

Mr. YATES. It is that far away from recovery?

Mr. MARES. It is a continuum of viscosity from heavy oil through to tar sands. We think the work in heavy oil could be applicable to tar sands. Some of our international work in tar sands would give us some knowledge that would be applicable. Some might be applicable here in the States, although the U.S. tar sands is oil wet whereas Canadian tar sands is water wet.

So there is a difference in processing required to do the tar sands work here in the States.

### OIL SHALE

Mr. YATES. How close to commercialization is the Geokinetics oil shale process?

Mr. MARES. We would say they are very close to being able to say that they are commercial or can obtain commercial support. And all the value from the knowledge base we can obtain has pretty much been obtained by now.

Mr. YATES. How widely applicable is the Geokinetics process to the range of oil shale resources in the United States?

Mr. MARES. I do not think it is that applicable. As I recollect, their process deals with thin seams, rather close to the surface. It is a fairly specific area which would be another reason that we should not continue to fund work in that area.

Mr. YATES. Why do you want to phase out research on eastern shales and concentrate on western shales?

Mr. MARES. It is an issue of the eastern shales being leaner than the western shales. I think, from a technical standpoint we ought to take on the technical problems one at a time. Technical problems, with today's paper, are going to be tough. Let's get one system up and running before we spread our research too thinly. I do not think that is a wise use of funds.

Mr. YATES. What response did you get from your invitation to industry and other groups to tour the Government's Anvil Points oil shale facility?

Mr. MARES. There were about 25 to 29 different entities, I cannot remember if they were entities or individuals, that visited the site. We do expect to be going out with a request for proposals relatively soon.

Mr. YATES. Did you have any research and development plans in going out with the request for proposal? Does that mean you don't have any now, you just want to see if they will respond?

Mr. MARES. The process that we started on revolves around the following situation. There is a lease to Development Engineering, Incorporated, which was 5 years, and renewed for 5 years, so it was a total of 10 years. It will expire on the 10th of May.

It would be wise for us to solicit generally to those interested in oil shale to allow everyone the chance to take the lease for future research work in oil shale.

So, we are going to be soliciting for proposals. The current tenant obviously can respond to the solicitation, as well as anyone else.

Mr. YATES. Will the work you are doing, at Anvil Points be applicable to other situations?

Mr. MARES. I believe that it will, yes, sir.

Mr. YATES. How much of your request is for work at Anvil Points?

Mr. MARES. I don't remember offhand.

Mr. YATES. You can put that in the record.

[The information follows:]

### ANVIL POINTS

There are no funds in the fiscal year 1983 budget request for the Anvil Points project.

### ENVIRONMENTAL MITIGATION

Mr. YATES. What other Government agencies are doing work in environmental mitigation?

Mr. MARES. EPA.

Mr. YATES. Just you and EPA?

Mr. MARES. No, I would expect that the Department of the Interior is conducting research. The Office of Energy Research is also funding work in basic sciences as related to understanding combustion products or understanding some chemical processes that would be applicable to enhancing our knowledge about environmental and health aspects of oil shale production.

Mr. YATES. You want $2.6 million for research on environmental problems which you describe as the most severe restraint to large-scale oil production. Is $2.6 million enough for that purpose?

Mr. MARES. Yes, sir.

Mr. YATES. You have to say, "yes," don't you?

Mr. MARES. Well, let's remember that each of the projects that had gone forward, Colony and TOSCO, had to meet and satisfy or obtain permits, from a whole host of environmentally interested agencies, State and Federal, which then set criteria by which they had to live.

Furthermore, we, by virtue of our Federal Government in helping to financially assist those, had rights to obtain samples, obtain information about their environmental performance. This will continue to be true, with TOSCO. I don't know whether it is in the Union contract. Our work is something that would be a follow-on from that, as well as a recognition that there are some issues from which there is still work that can be done.

### ENHANCED GAS RECOVERY

Mr. **Yates**. Let's talk about enhanced gas recovery. To what extent is coalbed methane technology being used in mining operations?

Mr. **Mares**. I don't know that I have seen explicitly any production survey which has said how much of the methane we try to extract from mines for safety reasons is recovered and utilized.

We think that the work that we have done to date does provide at least some technical basis from which people could try to extract that methane and use it commercially.

It comes up at low pressure, and you know that in the transmission lines which move it generally from where the gas is to where it is used, they run at a much higher pressure than is the pressure coming out of the wells. There have been cases, outside the example I mentioned earlier of the mine in Alabama from which U.S. Steel has been extracting the methane, and will be using it for subsurface uses.

### ANTHRACITE COAL

Mr. **Yates**. Anthracite, Mr. McDade's interest. What does your budget include to support this program, anything?

Mr. **Mares**. We have completed a series of studies and reports which we have submitted to the Congress that reflect the wide variety of things that we have looked at as it relates to anthracite coal.

Almost all of our technologies, combustion, gasification, liquefaction, can be applied to anthracite coal. We have continued, and will continue in fiscal year 1983, to be sensitive to the interests of anthracite coal and be aware of what is going on from the technical standpoint.

Mr. **Yates**. Is there any money in this budget for anthracite?

Mr. **Mares**. We don't explicitly fund activities formally for anthracite coal. As the Office of Fossil Energy, anthracite coal was one of the important areas of coal. We don't explicitly fund low-rank coal, bituminous or sub-bituminous or lignite. But we believe it is our responsibility to pay attention to anthracite coal and we will continue to do so.

Mr. **Yates**. Your answer is: There is nothing specific in this budget for that?

Mr. **Mares**. That's correct.

Mr. **Yates**. For anthracite coal.

Mr. **Mares**. There is no explicit line item.

## WESTINGHOUSE SYNTHETIC FUELS PROGRAMS

## FUNDING SUMMARY - MILLIONS OF DOLLARS

| | Prior Years | 1982 | 1983 | 1984 | 1985 | 1986 | TOTAL |
|---|---|---|---|---|---|---|---|
| Process Development (1 ton/hr pilot plant) | | | | | | | |
| Government | 53.3 | 6.5 | 5.0 | 5.0 | 5.0 | 5.0 | 79.8 |
| Private | 28.9 | 9.4 | 10.3 | 10.7 | 11.0 | 12.7 | 83.0 |
| Process Demonstration (50 ton/hr demo) | | | | | | | |
| Government | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Private | 4.7 | 18.5 | 32.7 | 21.7 | 16.3 | 37.1 | 131.0 |
| Commercial Application (Feasibility studies) | | | | | | | |
| Government | 2.3 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 6.2 |
| Private | 0.2 | 1.3 | 1.5 | 2.0 | 2.5 | 3.0 | 10.5 |
| Total | | | | | | | |
| Government | 55.6 | 10.4 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Cumulative | | 66.0 | 71.0 | 76.0 | 81.0 | 86.0 | 86.0 |
| Private | 33.8 | 29.2 | 44.5 | 34.4 | 29.8 | 52.8 | |
| Cumulative | | 63.0 | 107.5 | 141.9 | 171.7 | 224.5 | 224.5 |

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Mr. YATES. But it is not excluded from the funding that you have.

Mr. MARES. Far from it.

Mr. YATES. Mr. McDade will be glad to know that.

### LEASING

Have the leasing activities to the Department of the Interior been accomplished yet?

Mr. MARES. Almost. We hope the middle of this month.

Mr. YATES. Okay.

Mr. MARES. I hope we can say in the middle of June we have transferred the leasing program with your good help.

Mr. YATES. How many employees are transferred with the program?

Mr. MARES. We expect there will be nine transferred.

Mr. YATES. Are there any leasing functions the Department of Energy has that were not established in the DOE organization?

Mr. MARES. Not to my knowledge.

### COAL LOAN GUARANTEES

Mr. YATES. Have you actually issued any coal loan guarantees?

Mr. MARES. No, we have not. There is an applicant that we have made a tentative commitment to that is trying to put together its transaction and we are waiting for that firm to move.

Mr. YATES. You had five applications in 1981. Did those go by the boards, or are they still pending?

Mr. MARES. I don't know explicitly on all five. The one, if they successfully meet the standards, would exceed the loan reserve that we now have; therefore, we would be ill advised to entertain any others.

So we are waiting to see what happens in this particular application.

Mr. YATES. Did you have enough of a reserve to cover the request for loans?

Mr. MARES. For this one, but we don't think it would be wise to entertain any others at this stage.

### APPROPRIATION LANGUAGE CHANGES

Mr. YATES. Let's talk about appropriations language.

Prior to this time, there never had been a request for purchase of passenger motor vehicles associated with this budget. Now you want to buy seven vehicles. Why? Who needs a ride?

Mr. MARES. Sir, I will have to try to find that. Where are we in our compendium? What page?

Mr. YATES. We are on page FE-11. This is the top of the page, you want to purchase passenger vehicles, not to exceed seven. That could be one, two, three, four, is that one for you or for whom?

I thought Assistant Secretaries could use the Secretary's car.

Mr. MARES. I am sorry, sir, this is the first time I have seen this language. I will have to read it for just a minute.

I would rather come back and answer that for the record instead of speculating. I will assert it is certainly not for myself or anybody on my staff.

[The information follows:]

### APPROPRIATION LANGUAGE AUTHORITY FOR THE PURCHASE OF MOTOR VEHICLES

The proposed appropriation language reflects a proposal by the Department to merge the Fossil Energy R&D and Construction appropriations into a single account. The language is intentionally broad to cover any possible purchase which might be required during the conduct of program activities. The Fossil Energy fiscal year 1983 budget request does not include funds for the purchase of any passenger motor vehicles.

Mr. **YATES**. I didn't see any language for chauffeurs in there. Do they go with the vehicles?

Mr. **MARES**. It has not normally been the case in the Office of Fossil Energy. I think it is basically for the ETC's and the use for them.

I know they have vehicles, but they need them for their purposes.

### CLOSING REMARKS

Mr. **YATES**. We have numbers of questions that we thought you ought to answer for the record. Mr. Murtha will have questions, too.

I think we have concluded the hearing on that note.

If there are any other questions, we will let you know.

Mr. **MARES**. Fine.

Mr. **YATES**. Thank you very much.

Mr. **MARES**. Thank you, Mr. Chairman.

[The questions and answers follow:]

## ADDITIONAL COMMITTEE QUESTIONS

### Personnel Reductions

Question: Under the RIF procedures, what assurance would you have that you will keep the people you want?

Answer: In a reduction-in-force (RIF), we will be able to determine the knowledges, skills and abilities that are required in each position in the organization. Formal RIF procedures will then be used in order to determine which qualified Fossil Energy employees are entitled to be retained. While we will not be determining the employees to be retained on a name-by-name basis, we will be determining the skills mix that is required. No employee will be retained who is not fully qualified to perform the duties of his or her new position.

The existing Fossil Energy employees will have the sole right to compete for those 100 positions identified in the proposed organization, as the defined "competitive area" for this action will be Fossil Energy headquarters. This competition during a RIF will be in full compliance with Office of Personnel Management regulations which require full consideration of employee technical qualifications, time in service, job performance, as well as veterans preference. Employees' rights will be fully protected during this process.

As point of reference, it should be noted that during the last RIF in Fossil Energy we initially had to separate 126 employees but by the effective date this was reduced to 46 people. This was the result of heavy attrition and extensive management effort during the RIF process to reassign and bring back employees to vacancies created during this time. The net result was that many good and talented employees were placed back in positions where they have been making major contributions to the management of Fossil Energy programs. I am hoping that a similar situation will occur during this upcoming reduction.

Question: What is the driving force behind the proposed reductions?

Answer: We are implementing a headquarters reorganization which was developed on the basis that Fossil Energy will continue to move away from large-scale equipment development and demonstration and will focus on those long-range, high-risk research and development programs. As I stated to Fossil Energy employees at an all-hands meeting on April 2, 1982, in our view, the proposed headquarters organization will contain sufficient flexibility to handle the management of the transitional program now in place as well as the future program plans of Fossil Energy. The planned headquarters staff of 100 personnel, while significantly lower than the present on-board strength of 245 people, is sufficient to perform those essential program management functions appropriate to headquarters while relying on the Energy Technology Centers and other field organizations to execute projects.

Question: What personnel reductions do you have planned for the field? When would these reductions be made?

Answer: As the Secretary stated in his testimony before the Subcommittee on Fossil and Synthetic Fuels and the Subcommittee on Energy Conservation and Power on February 24, 1982, and in my testimony before a Subcommittee of the Senate Energy and Natural Resources Committee on March 17, 1982, no decision has been made regarding the future of any of the Energy Technology Centers. We are, however, committed to maintaining a proper balance between our in-house research and that conducted by outside contractors, universities and national laboratories. We are, therefore, presently examining various options to realign and streamline the field structure to maximize the use of available resources to effectively manage our programs. Critical factors in determining the final organization and structure include size and character of program/project reductions, judgment as to the critical staff capabilities and requirements, and program content to be conducted at each Center.

It is important to recognize that I am responsible for determining overall staffing requirements. There are two major reasons why the reduction is being taken this year at headquarters.

First is the division of responsibility between program formulation and policy development at headquarters and project implementation in the field. By making that clear delineation we can break the linkage between dollar amount and the size of the headquarters staff; that is, program and policy guidance becomes essentially independent from the level of program funds. Therefore, reorganizing with this management philosophy in mind requires a RIF in headquarters and this will meet our FY 1982 staffing requirements.

Second, we have deferred any substantial action involving the field until we have settled on the field structure for 1983 and until we have a clearer picture of the scope of the 1983 program. We may make some field moves to improve efficiency.

Question: At the proposed level, would you have to reorganize?

Answer: The Fossil Energy research and development (R&D) program is undergoing a major redirection. This program redirection has resulted in lower funding and staffing requirements, changing priorities and program content which required the initiation of a new organizational concept. We recently had a new organization approved.

The reorganization was developed on the assumption that Fossil Energy will continue to move away from large-scale equipment development and demonstration and will focus on those long-range, high-risk efforts as contained in the FY 1982 revised and proposed FY 1983 budget requests which are now before the Congress. Also, the reorganization took into consideration the requirements of a headquarters and field organization viewed as an entity to plan, oversee and execute the changing Fossil Energy program. The proposal also accommodates the present and anticipated limitation of funding and staff by appropriately streamlining and consolidating activities to meet constraints. The plan continues the Energy Technology Centers as an integral part of the Fossil Energy organization to carry out program execution and maintains a strong commitment to decentralization.

In our view, the proposed headquarters organization contains sufficient flexibility to handle the management of the transitional program now in place as well as the changed program being proposed to Congress. The planned headquarters staff of 100 people, while significantly smaller than the present on-board strength of 246 people, is sufficient to perform those essential program management functions appropriate to headquarters while relying on the Energy Technology Centers to execute projects.

Question: Why do you not take any reduction in the Senior Executive Service positions when you are reducing other staffing and the general program effort?

Answer: Reduction-in-force (RIF) for Senior Executive Service (SES) members is not a Fossil Energy action. As stated in the recent DOE Order on RIF's for SES's, the competitive area for such RIF's is DOE-wide and, therefore, would be conducted on the basis of Departmental requirements. As a result of our organizational planning, however, we will require fewer senior executives to effectively staff the new Fossil Energy organization. Those who become surplus to our needs will be referred to the Executive Personnel Board for consideration for other SES positions in the Department, and will ultimately be subject to separation by RIF if neither the Department nor the Office of Personnel Management is successful in matching their expertise against other SES vacancies in the Government.

SRC-I

Question: Please bring the Committee up to date on the status of SRC-I.

— What work has continued in FY 1982?
— Would you consider SRC-I a likely candidate for the Synthetic Fuels Corporation?
— When do you think the SRC-I project would be ready to apply to the Corporation for assistance?
— How much of the $129,600,000 available for SRC-I in FY 1982 was used to determine the baseline cost estimate?
— Would you still expect to have a cost estimate to the Committee by June 1, 1982?
— What other uses have been made of the FY 1982 money?
— What do you propose for the balance of the $129.6 million?

Answer: Preparation of the project baseline and limited effort in selected areas of design have continued in FY 1982.

It is believed that the SRC-I project is a likely candidate for SFC assistance.

The DOE believes that with the completion of the SRC-I baseline a sufficient data base exists for ICRC to apply to the SFC and the private sector for assistance. However, the time required to put this data into a proposal to SFC or the private sector would have to be determined by ICRC. At this time DOE has no information regarding ICRC's intent on submitting a proposal to SFC or the private sector.

The cost to develop the technical, schedule, and cost baseline that has been spent from October 1, 1981 (original notification date) to March 31, 1982 (the completion date) is approximately $30 million.

It is anticipated that the baseline data will be forwarded to the Committee by June 1, 1982.

## Control Technology and Coal Preparation

Question: Please explain the significance of the combined flue gas cleanup activity. Are all the systems in the R&D stage?

Answer: The combined flue gas cleanup activity was reoriented in 1982 to focus on the development of simple and economic cleanup systems to meet the emission limits anticipated for the late 1980's and 1990's. We are assuming that $SO_2$ and particulate limits will be about the same as they are today and that $NO_x$ limits will become more stringent. The approach taken to meet these objectives is to seek ways of removing both $NO_x$ and $SO_x$ in a single reactor. Attention is also given to minimizing the use of premium fuels in the cleanup process and to promote processes which produce useful or benign waste products. Modest efforts in particulate cleanup focus on developing small systems which will be effective on high resistivity ash and on respirable particles. All the work being considered would fall generally within the R&D stage.

Question: In your opinion, which has more promise, the electron irradiation system or the Sulf-X process which is being developed by Pittsburgh Environmental and Energy Systems, Inc? Will the request support both processes?

Answer: In our opinion, the electron irradiation processes have more promise than the Sulf-X process because of superior ability to remove $NO_x$ from flue gas streams. The electron irradiation processes can remove 90% $NO_x$ as well as 90% $SO_x$ from flue gas streams. The Sulf-X process is essentially an $SO_2$ removal process which has been shown to have high $SO_x$ removal capability but it is not in the range of the electron irradiation processes. DOE has sponsored tests of the Sulf-X process in the past but has not included funds for future tests in its current request. The budget request does not allow for support of the Sulf-X process in addition to the commitments made for the electron irradiation evaluations.

Question: The goal of the coal preparation and analysis program is to get 90 percent or more of the ash and sulfur out of coal.

— What are the advanced, unconventional methods to extract organic sulfur from coal you will be exploring? Which are most promising?
— To what coal burning processes would this technology be useful?

Answer: Two methods are being explored, both based on the reaction of coal with sodium hydroxide or a mixture of sodium hydroxide and potassium hydroxide. In TRW's concept, coal is reacted with molten alkali for about 30 minutes at 375°C. The G.E. process passes a mixture of coal and alkali through a microwave heating chamber. Both processes have proven capable of reducing both sulfur and ash to below 0.5 percent and at this stage, it is not possible to determine whether one concept has any advantage over the other.

A chemically cleaned, premium quality coal would offer maximum economic and environmental benefits in the conversion of existing boilers from gas or oil to coal and in new boilers especially designed to take full advantage of the premium quality. Very low ash, finely divided coals offer additional opportunities to reduce oil dependency as gas turbine engine and diesel engine slurry fuels.

Question: The fuel cell cleanup systems development (p. 23) appears to be directed only at the molten carbonate fuel cell.

— What need is there for cleanup systems work related to the phosphoric acid fuel cell system?

Answer: Inasmuch as the present plans call for the use of only natural gas or naphtha as the source of hydrogen for the phosphoric acid fuel cell (PAFC) and considering current fiscal constraints, gas cleanup work related to PAFC is considered low priority. If a decision were made to investigate the use of hydrogen from coal gas for the PAFC, there would be a need to investigate the fuel processing/gas cleanup requirements for the PAFC since they would be considerably greater than for the molten carbonate fuel cell (MCFC). However, since the PAFC operated at a considerably lower temperature than the MCFC, it is expected that the economic incentive for development of hot gas cleanup process would be considerably smaller for the PAFC than for the MCFC.

Question: Cleanup base technology is being reduced from $5.3 million to $400,000.

— Why are you revising the cleanup base technology to focus on combustion system waste management and characterization?
— What work is needed to make a determination of the economic and technical trade-offs among various pollution control technology options?

Answer: The cleanup base technology program was revised some time ago to develop the basic tools and technology to address the economic and technical trade-offs among various pollution control technology options. With the reduction in the FY 1983 budget from $5.3 million to $400,000, the concommitant reduction in projects on a priority basis has resulted in the waste management and characterization activity as the top priority items.

The work needed to make a determination of the economic and technical trade-offs among various pollution control technology options includes the development of an adequate proof-of-concept technology base to define the total system (or process) design to permit development of acceptable capital and operating costs for each process. As stated in the preceding paragraph, the waste management costs are a very vital part of the total economic analysis of any given pollution control system.

## Advanced Research and Technology Development

Question: Please provide for the record the approximate amounts of advanced research and technology development funding that go to the energy technology centers, industrial organizations, and universities.

Please provide a trend over fiscal years 1981, 1982 and 1983 in the breakout of this funding.

In terms of size, how would you characterize the industrial organizations which support the program activity in Advanced Research and Technology Development?

Answer: The attached table provides the approximate amounts of the Advanced Research and Technology Development funding to national laboratories, energy technology centers, universities, and industrial contractors for fiscal years 1981, 1982 and 1983.

The industrial organizations supporting the Advanced Research and Technology Development activity are very diverse in size, ranging from small business concerns to companies with sales in the hundreds of millions. It is very difficult, therefore, to accurately characterize or classify the firms except to say that they cover all sales and employee levels.

Question: Provide for the recrod the specific projects to be funded by the $1,000,000 for General Plant Projects, including the Energy Technology Centers (ETC) where the work is to be accomplished.

Answer: The following data is based on the assumption that no FY 1983 General Plant Project funds will be spent on the western ETC's because of the uncertainty of their future DOE role.

| Morgantown Energy Technology Center | $000 |
|---|---|
| 1. Exterior Preservation, Phase I | $100 |
| 2. Security Exclusion Fencing, Phase I | 150 |
| 3. Computer Room Cooling | 200 |
| 4. Modification of Electrical Feeds | 50 |
| | $500 |

| Pittsburgh Energy Technology Center | |
|---|---|
| 1. Hazardous Material Storage Building | $150 |
| 2. Hygienic Facility (Bldg. 83) | 60 |
| 3. Electrical Upgrading - Pumphouse (Bldg. 71) | 10 |
| 4. Fire Water Loop Tie Connection | 80 |
| 5. Renovation of Building 900 | 120 |
| 6. Replacement of Obsolete Service Piping, Phase II | 80 |
| | $500 |

## Advanced Research and Technology Development

Question: The justification at page 33 states that government supported university activities can be found throughout fossil energy programs. Provide for the record the detail which supports this statement. Also provide for the record the details related to the fossil related basic research to be continued by the Office of Energy Research.

Answer: Fossil Energy university funding by resource area for Fiscal Years 1981, 1982 and 1983 is shown in the table below:

| | $ In Millions | | |
|---|---|---|---|
| | FY 1981 | FY 1982 | FY 1983 |
| Coal | $28.23 | $18.75 | $ 5.25 |
| Petroleum | 3.84 | 1.70 | 1.14 |
| Gas | 1.23 | .85 | - |
| TOTAL | $33.90 | $21.30 | $ 6.39 |

While no funds are requested for the University Coal Research program in FY 1983, Government supported university activities can be found throughout Fossil Energy programs. Necessary university research will be carried out by the direct program activity rather than in the crosscutting area. In addition, such fundamental work as formerly funded under the university coal research grants is also found at the Energy Technology Centers and in industry. Also, the Office of Energy Research will continue to fund a broad range of fossil related basic research in universities.

## Coal Liquefaction

Question: Could you bring the Committee up to date on the status of the H-Coal pilot plant.

-- What is the estimated cost to the government to return the plant site to its original condition if no private group will take over the plant?

— How would keeping the H-Coal pilot plant operating facilitate the H-Coal process group now in final negotiations with the Synthetic Fuels Corporation?

Answer: Approximately $23,900,000 is being held in reserve for pilot plant decommissioning and demolition.

The process group now in final negotiations with the SFC is also the operator of the H-Coal pilot plant. Consequently, transfer of the pilot plant would provide that group with an operating plant that will be totally under their control and can be operated in the manner that they deem to be most beneficial to support their H-Coal objectives.

Question: A December 21, 1981, DOE press release hailed the success of testing high sulfur Illinois coal at the H-Coal plant.

— What other coals have been tested at the plant?
— Provide for the record the results of the tests of the various coals at H-Coal.

Answer: The original operating plan for the pilot plant called for testing of Illinois #6 bituminous and Wyodak sub bituminous coals. Plant shakedown operations were to be done with Kentucky 11 bituminous coal. The Illinois #6 test was completed. Both Kentucky #9 and Kentucky #11 coals were processed during non test periods. The most recent operation was with the Wyodak sub bituminous coal; however, it is not yet completed.

The Illinois #6 coal test demonstrated the operability of the H-Coal reactor thus greatly minimizing the risk in scaling up to commercial size. Valuable information was developed in the performance of critical mechanical equipment such as slurry valves, pumps, and heaters. Improvements in the components extended the operating run time, improved mechanical reliability, and provided data for the design of comparable equipment for commercial plants. Additionally, the plant provided process data of a quality sufficient to correlate with the small scale PDU and bench units.

Question: Please bring the Committee up to date on the status of the Exxon Donor Solvent pilot plant.

— What further obligations does the government have to this project?
— Would you expect Exxon to complete further tests before shutting the plant?
— Provide for the record details of the results of the tests of the various coals at the Exxon Donor Solvent pilot plant.

Answer: DOE participation in this Cooperative Agreement is fully funded. The government has no obligation beyond the funding committments now in place.

Yes, further tests will be completed before closing the plant. Exxon and the non-government participants are currently conducting the third of the three planned coal tests without government funding.

The following provides results using various coals:

o Shakedown operating once through mode, Illinois #6 Coal - nine runs totalling 1245 hours of coal feed.

o Testing - once through mode, Illinois #6 coal - eight runs totalling 2658 hours of coal feed.

## AR&TD
## FUNDING LEVELS BY SUBACTIVITY BY PERFORMER

| | FY 1981 | | | | | FY 1982 | | | | | FY 1983 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LABS | UNIV. | ETC'S | INDUSTRY | TOTAL | LABS | UNIV. | ETC'S | INDUSTRY | TOTAL | LABS | UNIV. | ETC'S | INDUSTRY | TOTAL |
| UTIL (1505) | 2,111 | 1,115 | 1,461 | 6,378 | 11,065 | 1,500 | 454 | 2,811 | 5,658 | 10,423 | 300 | 630 | 1,133 | 2,137 | 4,200 |
| M&C (1510) | 6,213 | 1,100 | 520 | 3,244 | 11,077 | 7,227 | 850 | 420 | 1,165 | 9,662 | 3,750 | 960 | ... | 90 | 4,800 |
| **PROCESSES:** | | | | | | | | | | | | | | | |
| GASIF (151505) | 1,356 | 1,504 | 831 | 6,204 | 9,895 | 890 | 1,520 | 943 | 5,970 | 9,323 | ... | 360 | 450 | 1,440 | 2,250 |
| LIQ (151510) | 2,950 | 4,260 | 2,772 | 1,447 | 11,429 | 3,470 | 4,307 | 1,028 | 630 | 9,435 | 800 | 1,140 | 600 | 210 | 2,750 |
| S/T | 4,306 | 5,764 | 3,603 | 7,651 | 21,324 | 4,360 | 5,827 | 1,971 | 6,600 | 18,758 | 800 | 1,500 | 1,050 | 1,650 | 5,000 |
| UCR (AA95) | ... | 5,000 | ... | ... | 5,000 | ... | 5,189 | ... | ... | 5,189 | ... | ... | ... | ... | ... |
| PROG. DEV. (AA1520) | 3,360 | 581 | 380 | 3,576 | 7,897 | 1,675 | 154 | 2,793 | 4,444 | 9,066 | ... | 300 | 1,200 | 1,500 | 3,000 |
| TOTAL | 15,990 | 13,560 | 5,964 | 20,849 | 56,363 | 14,762 | 12,474 | 7,995 | 17,867 | 53,098 | 4,850 | 3,390 | 3,383 | 5,377 | 17,000 |

Note: Totals of FY 1982 and FY 1983 at the ETC's and for industrial contractors reflect the current unsettled nature of the Fossil Energy program, especially with regard to the organizational and functional realignment under consideration at the ETC's. The totals for all participants in FY 1982 and FY 1983 represent current planning and are therefore subject to change.

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- Testing - Bottoms Recycle Mode, Wyodak Coal - two runs totalling 1842 hours of coal feed.
- Testing - Bottoms Recycle Mode, Illinois #6 coal - four runs, 2024 hours of coal feed.
- Testing - Bottoms Recycle Mode, Wyodak coal - 838 hours of coal feed. These tests have established design points for the liquefaction portion of the process using Illinois #6 and Wyodak coal in the bottoms recycle mode.

Question: In general, how would you characterize the contribution of the H-Coal and Exxon Donor Solvent pilot plants to the development of liquefaction technology?.

— What have we learned from these two technologies that may be applicable to others?

Answer: The major contribution of these programs to the development of liquefaction technology has been their demonstration of the operability of the two second generation processes and the development of data to support scaleup to commercial operations.

These two technologies have compiled valuable data concerning the design, operation and maintenance of various process steps and components for use in coal liquefaction processes. Both the H-Coal and EDS pilot plants are the largest direct coal liquefaction plants that have been built. As such, their equipment is of commercial design and of a scale that permits scaling to commercial plants. During the operation of both plants, valuable information has been developed in areas such as slurry preheater performance, letdown and block valve design, materials of construction, and pump design and packing. The results of equipment performance have been shared with the coal liquefaction community through periodic meetings as well as informal discussions with interested parties.

Question: What is the status of the M-gasoline process pilot plant being built in Germany?

— What is the extent of cost sharing by the German Government and by Mobil in this project? (p. 494 last year)

— Will the FY 1983 request keep the pilot plant on its original schedule?

— What are the relative advantages of the M-gas process?

— What is the basis for the optimism that leads you to state in the budget justification that there is a "high probability of royalty payments exceeding government investment in the project"? (p. 40).

— How does the Mobil process you are supporting compare to the gas to gasoline project that Mobil is building in New Zealand?

Answer: The M-gasoline pilot plant in Germany is under construction. Mechanical completion is scheduled for October 1982 and startup and test operations will follow.

· The total cost of the Project was estimated at 63 million DM based on August 1979 price levels with a 6 percent increase per annum built in depending on the projected dates of expenditure. The costs are to be borne by BMFT,DOE, and industry as follows:

BMFT - 1/3
DOE - 1/3
Industry - 1/3

Of the industrial share, 14 million DM has been agreed upon as the value of the catalyst which is to be contributed by Mobil. The remaining industrial share is provided in equal proportions by the German firms URBK and UHDE. The FY 1983 requested funds will keep the project on schedule.

The principal advantage of the M-gasoline process is the highly selective conversion of methanol(a fuel without a current U.S. market) to high-octane unleaded gsoline (a specification fuel in wide use in the U.S.).

The process under study in Germany uses a fluid bed reactor to achieve essentially isothermal operation which exerts a substantial improvement on yield structure and product purity compared to the fixed bed reactor system to be used in the New Zealand commercial plant. The high level of industrial interest in use of the Mobil process for the conversion of methanol to gasoline (e.g., in projects proposed to the SFC and in the feasibility studies funded by DOE) is the basis for optimism that royalty payments will exceed the government investment. The royalty sharing formula, which provides up to 200% of the total money contributed by the U.S. Government, is already a part of the project agreement.

Question: The advanced process development subactivity is being reduced by 50%, $27,456,000 to $13,800,000.

— What portion of this decrease is attributable to termination of work related to specific process development? For the record, provide a detailed list of amounts being terminated and which technologies these amounts supported.

Answer: The $27,456,000 shown under the Advanced Process Development subactivity in the FY 1982 column includes $11,808,000 of FY 1982 funds obligated for operations at the Wilsonville research facility. In the FY 1982 budget request these funds were shown under the SRC pilot plant subactivity. This change was made to reflect a redirection of the use of the Wilsonville facility away from SRC-I design support to advanced process development activities. No funds are being requested for Wilsonville in FY 1983. Carryover FY 1982 funds together with EPRI cofunding contributions in CY 1983 will fund Wilsonville for FY 1983 operations.

The remaining reduction of $1,848,000 will be accommodated by a redirection in scope of work of industrial contracts and a reduction in level of effort in in-house research at PETC. No termination will be required.

Question: There is no request for pyrolysis and hydropyrolysis for FY 1983.

— What is the significance of pyrolysis and hydropyrolysis to the liquefaction process?
— What advantage or disadvantage do these processes have over the solvent systems of indirect liquefaction? (p. 567)
— What industry interest is there in these processes?

Answer: The significance of pyrolysis and hydropyrolysis to the liquefaction process is that it offers in concept a relatively simple technology for producing liquid fuels from coal. Pyrolysis is an old technology which has been practiced for many years on a commercial scale as represented by the coking industry. The pyrolysis concept to maximize the yield of liquid products was actually pursued for many years and resulted in the development of a number of low temperature carbonization processes (LTC).

Recent research has been aimed at re-examination of this old art to determine whether there are circumstances where pyrolysis processes may be more economical and more readily commercialized than other technolgies for converting coal to liquid fuels.

Research into pyrolysis and hydropyrolysis has indicated that the disadvantages of producing liquid fuels from coal with this technology outweigh the advantages. The advantages of pyrolysis involve its relatively simiple concept and the ability to produce a liquid product without hydrogen addition. However, the disadvantages of pyrolysis and hydropyrolysis include the low quality of the liquid product, low liquid yield, and high production of char for which there is little demand.

Industry interest in these processes is minimal. Occidental Research, which has been cofunding pyrolysis research with the DOE, has recently indicated a lack of interest in continuing to support this work. The research Rockwell International (RI) was conducting on hydroliquefaction for liquid fuel production was stopped during FY 1982 with no indication that RI planned to fund further research in the area of liquid fuel production. Support for these processes by other organizations is also considered weak.

Question: What portion of the support studies/engineering evaluations subactivity (p. 44) will be used to analyze data from H-Coal and Exxon Donor Solvent?

— At what level will you continue studies to identify and develop process modifications which will mitigate the toxic effects which have been identified for coal liquids?
— How does this compare to the level of effort in FY 1982?

Answer: Data base compilation activities for EDS and H-Coal data are underway now as part of the overall coal liquefaction data base management program being conducted at PETC using major project funding. Critical assessment and analysis of the data, supported by funds from the support studies/engineering evaluation subactivity, will be initiated in FY 1983. At the funding level requested, we anticipate that several hundred thousand dollars will be used to initiate this effort.

Health effects studies to evaluate mitigation of toxic effects through modifications in liquefaction processes and/or hydrotreating of liquefaction products is budgeted at $1.2 million for FY 1983. In FY 1982, $2.0 million was obligated for these activities.

Question: — What are the potential uses for the methanol that could be produced from this process?

— Would the catalysts under development in the liquid phase methanol project be adaptable to other processes?

— When govenment funding was originally agreed to for liquid phase methanol, through what stage of development was the process to be taken?

— To what extent has the development been delayed by the deferral? What impact does this delay have on the amount that would be needed in FY 1983?

Answer: In the past, and still today, methanol has found use primarily in petrochemical and other non-fuel markets. However, methanol can be made from coal by gasification, followed by syngas conversion and this has sparked interest in the potential large scale use of methanol as a fuel. Potential uses include direct use as an automotive or turbine fuel. Alternatively, methanol can be converted to high octane gasoline for use in existing markets.

The objective of catalyst development in the indirect liquefaction program, including the liquid phase methanol project, is to develop more efficient, selective catalysts for conversion of synthesis gas to high quality, marketable products such as a gasoline and middle distillate fuels. The chemical function requirements of the catalysts would be adaptable to other syngas conversion processes having the same product objections. The physical requirements on the catalysts, imposed by the liquid phase process concept, would not be directly transferrable.

Government funding originally agreed to for this project, would carry through the proof-of-concept stage of development.

Development activities in FY 1982 have not been delayed by the deferral action; therefore, the deferral action does not affect the amount of funds that would be required in FY 1983.

Consistent with the House direction provided to DOE in their action to overturn the proposed deferral, we are continuing all efforts on this project through FY 1982.

Question: How many unused facilities do you have in the liquefaction area that you continue to fund and how much does it cost to keep these facilities in mothballs?

— What is the advantage of keeping these facilities?

— On an overall basis in the fossil energy program, what facilities do you have in such status?

— How much do they cost and where are they funded?

— Have you initiated any steps to dispose of these facilities?

Answer: There are two unused liquefaction facilities now being maintained in mothball status; the Cresap facility near Moundsville, W. Va., and the Bruceton Liquefaction/Gasification PDU at PETC. Maintenance costs of these facilities totals approximately $500,000/year. The Department has concluded that these facilities have no further use in the liquefaction R&D program, and as a consequence, both are being disposed of in accordance with government surplus property disposal regulations.

Two other Fossil Energy facilities are in mothball status; the $CO_2$ deceptor pilot plant at Rapid City, South Dakota and the Atmospheric Entrained-Bed gasifier at Windsor, Connecticut. The annual maintenance costs are $205,000 and $240,000 respectively and are funded from the technical support line item within the Surface Coal Gasification activity. Both facilities are to be disposed of in accordance with government surplus property disposal regulations.

The U-Gas pilot plant at Chicago, Illinis is in the process of being mothballed and the annual maintenance cost is estimated at $240,000. However, negotiations to transfer the title of the facility to the Institute of Gas Technology are in the final stages and it is believed that the actual transfer will take place in the immediate uture.

## Combustion Systems

Question: -- What problems have you encountered with the operation of the Great Lakes Naval Training Station and Shamokin, Pennsylvania AFB boilers?

— Why were the tests originally planned for the Great Lakes project reduced?

— What impact will curtailing these tests have on the Navy's acceptance of the facility?

— Provide for the record a list of current atmospheric fluidized beds in operation, their capacity and location.

— Provide for the record the same information for those that you know are either in construction or in the planning stage.

Answer: Problems encountered in operation at Great Lakes Naval Training Station relate generally to the following systems and equipment: raw coal handling - silo fires - frozen coal; coal dryer; coal feed - solids handling; fly ash reinjection; and bag house operation.

Some similar system and equipment problems have been experienced at other AFB facilities.

Problems encountered in projects operation at the Shamokin AFB boiler relate generally to the following: raw anthracite culm handling; ash cooler; refractory abrasion; and lack of commercial steam load.

The Great Lakes facility is now undergoing acceptance testing prior to formal transfer to the Navy for a 30-month operational test. The Shamokin facility will complete its operational test period in late 1983.

The tests orignially planned for the Great Lakes Project were reduced to achieve control on the total project cost. An overrun associated with construction and startup of the facility reduced the funds available for parametric testing. Nevertheless, the DOE will complete the acceptance tests which were mutually agreed to by DOE and the Navy so that a safe and operable facility will be turned over to the Navy. Limited parametric testing will be conducted in addition to the acceptance tests.

The Navy has expressed concern to DOE about the reduction of testing. It is DOE's contention that elimination of this testing will not affect the operation of the facility. DOE has agreed to complete the previously agreed to acceptance testing at which the 30 month operation of the facility becomes a Navy responsibility.

Attachment B is a current listing, to the best of our knowledge, which describes the status of atmospheric fluidized bed boilers in operation, design and construction.

Question: In the past, DOE has supported two pressurized fluidized bed combustion pilot plants, one at Grimethorpe, England and one at Woodridge, New Jersey.

— What would this additional amount of money provide in the way of further tests and information?

Answer: The DOE budget request for the IEA Grimethorpe project of $2.5 million in FY 1983 is less than the original $6 million planned; however, the request is adequate to allow the U.S. to complete its participation in the revised test program. The U.S. remains committed to the completion of a viable program at Grimethorpe. With a reduction of U.S. funds it is assumed that both the U.K. and FRG have agreed to a revised test plan combining test series 2 and 3 and reducing the scope of test series 4. We believe that a slightly scaled-down test program which has been devised will still provide substantial and adequate data to U.S., U.K., and FRG industry; therefore, no additional funds are required.

Question: How much has the proposed deferral delayed the construction of the Woodridge pressurized fluidized bed combustion pilot plant?

— What effect on costs might this delay have?
— When do you now expect the pilot plant construction to be complete?
— What support does Curtiss-Wright have arranged for the operating phase?
— What would the annual operating costs be? How many years would the pilot plant be operated?
— What involvement do you expect from the Electric Power Research Institute in this project?
— What is the focus of the pressurized fluidized bed research at New York University? (p.50)

Answer:

o The delayed construction of the pilot plant, based on information and data known to date, is expected to increase the construction costs by $0.35M per month due to inflation. Management and engineering costs are $0.56M per month to keep key staff available.

o We are currently reviewing a proposal submitted by Curtiss-Wright (CW), if construction is initiated before the summer of year 1982, construction could be completed in the Fall of 1983.

o CW is currently investigating the possibilities of substantial industry cost-sharing arrangements for the operating phase. However, firm commitments for cost-sharing have not been finalized. Discussions continue with EPRI, Utilities, coal companies, National Coal Association, and State agencies.

o The original schedule, Phase IV, included a pilot operation, test and evaluation period of two years (February 1983 - January 1985). The annual operation cost for each year is estimated at $6.0M with the coal being supplied through National Coal Association or one of the coal companies.

o EPRI has expressed a considerable interest in the CW pilot plant, with intentions to participate in test program planning and the operation phase.

o The NYU PFB test rig is designed to perform basic research and development. A total of five test series are planned, i.e., effects of scale-up, sulfur absorption tests, sorbent particle attrition tests, fuel tests (lignite, coal and low rank coals), and heat exchanger tests.

Question: The alternative fuel utilization activity is being reduced from $4,224,000 to $2,000,000.

— What effect will this reduction have on the development of coal-water mixtures? Will it slow the program announced in the January 1982 press release?
— To what extent is there private sector research in coal-water mixtures?

Answer: The $2,224,000 FY 1983 reduction request in FY 1983 was predicated on a six-month programmatic schedule slip; therefore, a smaller cash flow is required for FY 1983 than previously anticipated. The contracts for this effort will be signed just prior to the second half of FY 1982 instead of the beginning of FY 1982. Combustion Engineering has been selected to perform all combustion and fuels characterizations and TRW will perform system component characterizations for this effort as per the January 1982 press release.

Private sector research in coal-water mixtures (CWM) is concentrated in the area of fuel preparation. There is little or no research activity in the field of combustion, system component, or fuel characterizations of coal-water mixtures. Our research efforts in the afore stated characterization areas are the result of a DOE sponsored CWM work-shop in March of 1981 where major private sector participants answered the basic question, "what role should the government play, if any, in the development of CWM technology?" The private sector consensus is that the government should concentrate its efforts in the development of a generic data base in the areas of combustion, system component and fuels characterizations, leaving actual fuel development to individual private sector groups.

Questions: Would those facilities using coal-oil mixtures be able to make a relatively simple, low-cost conversion to coal-water mixtures?

Answer: Since the major conversion considerations for coal-oil mixtures (COM) and coal-water mixtures (CWM) are similar, it is envisioned that the cost of converting from COM to CWM would be relatively simple and minimal in cost.

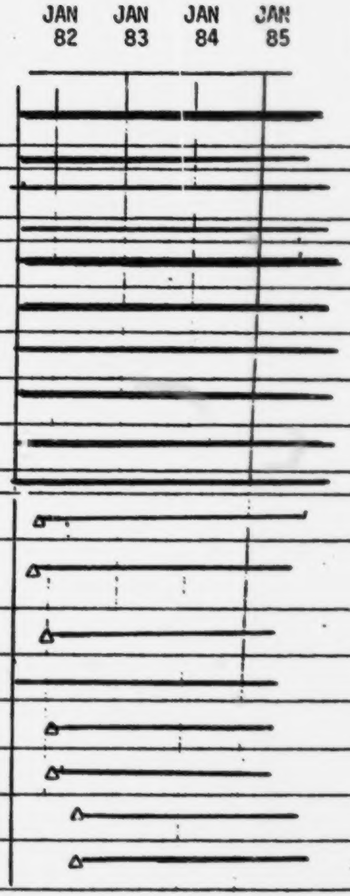
Question: What alternate fuel mixtures other than coal-water mixtures such as peat-coal-oil, methanol-coal, ethanol-coal or biomass liquids are promising?

Answer: Both methanol/ethanol-coal-water and peat-coal-ethanol/methanol appear promising from a combustion point of view. However, no detailed assessments have yet been performed on any of the alternate fuel mixtures other than coal-oil mixtures (COM), and coal-water mixtures (CWM). These assessments are part of our overall Alternate Fuels Utilization program plan and will be initiated in late FY 1982 and early FY 1983.

Question: To what degree will the research you propose be applicable to these other mixtures?

Answer: The basic uncertainties associated with any mixture lies in four specific areas: preparation and handling, combustion reactions, effects on heat transfer surfaces and system components, and effluents. One common element in the mixtures we have explored to date has been coal. Hence, the erosive actions of coal in one mixture can be assumed to be

## INDUSTRIAL SIZE ATMOSPHERIC FLUIDIZED BED BOILERS OPERATIONAL STATUS OCTOBER 1981



| FACILITY | LOCATION | CAPACITY (000) lbs/hr | Steam Condition PSI | Steam Condition Temp F | Fuel | Boiler MFS | Remarks |
|---|---|---|---|---|---|---|---|
| Georgetwn Univ. | Wash.D.C. | 100 | 625 | Sat | Coal | Foster-Wheeler | Water tube |
| Central Soya | Marion,Ohio | 40 | 200 | Sat | Coal | Johnston | Firetube |
| VanBuren Alcohol | VanBuren, Iowa | 20 | 225 | Sat | Coal | Thermal Processor | Firetube |
| Renfrew | Scotland | 45 | 400 | 540 | Coal | Babock LTD | Watertube |
| Flingorn Power Station | Germany | 110 | 250 | 750 | Coal | Deutsch& Babcock | Watertube |
| Paper Co. | Kaulta,Finland | 200 | 1220 | 970 | Multi Fuel | Ahlstrom | Circulating Bed |
| Paper Co. | Pihlaua,Finland | 35 | 1220 | 970 | Multi Fuel | Ahlstrom | Circulating Bed |
| DiBao Power Plant | China | 286 | 588 | 840 | Anthracite Culm | | Watertube |
| Yiyang, Hunan | China | 77 | 605 | 794 | Anthracite | | Watertube |
| Jiangapen,Guangdong | China | 110 | 605 | 794 | Anthracite | | Watertube |
| Great Lakes Naval/ TC | Waukegan,IL | 50 | 365 | 560 | Coal | Comb.Engr. | Watertube |
| ShamokinArea Ind.Corp. | Shamokin,PA | 20 | 150 | Sat | Anthracite Culm | Curtiss-Wright/ Koeler | Watertube |
| Central Ohio Psy Hosp | Columbus,Ohio | 60 | 175 | Sat | Coal | Babcock Ltd-Relay | Watertube |
| IBM<br>Dortmond/FRG | Charlotte,NC | 20 | 250 | Sat | Multi-Fuel | Johnston | Firetube |
| Colliery | Germany | 73 | 485 | 797 | Coal Tailings | Deutsche Babcock | Watertube |
| Conoco Oil Co. | Uvalte,Tex | 50 | 2500 | 80%Qual | Coal | Struther Wells | Oil Field Steamer |
| Royal Shell Oil | Holland | 110 | 1175 | 923 | Coal | Foster Wheeler | Watertube |
| Campbell Soup | Napoleon,Ohio | 50 | 250 | Sat | Coal-oil | Johnston | Firetube |

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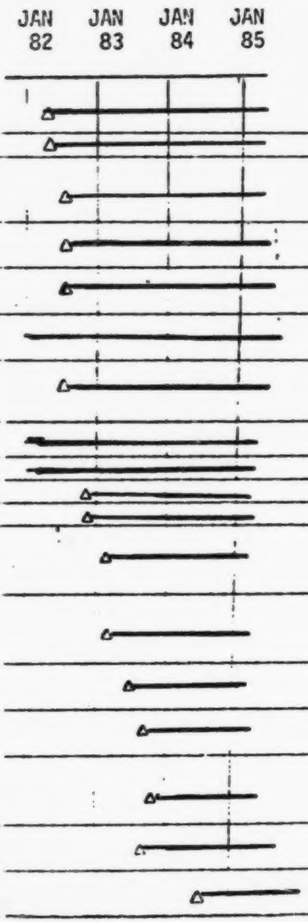
## INDUSTRIAL SIZE ATMOSPHERIC FLUIDIZED BED BOILERS OPERATIONAL STATUS OCTOBER 1981



| FACILITY | LOCATION | CAPACITY (000) lbs/hr | Steam Condition PSI | Steam Condition Temp F | Fuel | Boiler MFS | Remarks |
|---|---|---|---|---|---|---|---|
| Campbell Soup | Maxton, NC | 50 | 300 | Sat | Coal | Johnston | Firetube |
| Campbell Soup | Salisbury, MD | 50 | 150 | Sat | Coal | Johnston | Firetube |
| TVA Pilot Plant | Shawnee, KY | 165 | 2400 | 1000 | Oil<br>Coal | Babcock Wilcox | Watertube |
| Iowa Beef Proc. | Amarillo, Tx | 70 | 650 | Sat | Coal | IBW-Wormser | Wormsergrate |
| Enpex Texas Tar Sand | Maverick, Tx | 50 | 2450 | 80% Qual | Coal | ERCO-Na/Co | Oil Field Storage |
| Tobacco Proc.Co | Brazil | 25 | 200 | Sat | Alcohol<br>Coal | Johnston | Firetube |
| Mitsui ToatsuChan | Japan | 55 | 356 | 482 | Coal | | Watertube |
| Schoal Heating | Spencer, Ind. | 2.5 | 30 | Sat | Coal | Johnston | Firetube |
| Manufacturing Plt. | Fortville, Ind | 2.5 | 150 | Sat | Coal | Johnston | Firetube |
| Lumber Mill | Crestview, Fla | 20 | 300 | Sat | Wood | Johnston | Firetube |
| Alcohol Dist.Plt. | Bardtown, KY | 10 | 150 | Sat | Coal | Johnston | Firetube |
| Atlas Cons.Mining &Development | Phillipine Isl. | 330 | 900 | 905 | Coal | Deutsche/ Babcock | Watertube |
| Kentucky Agri. Energy | Franklin, KY | 60 | 550 | Sat | Coal | Foster/ Wheeler | Watertube |
| Ashland Oil Co. | Ashland, KY | 325 | 450 | 750 | Refin. Gas | Foster/ Wheeler | Watertube |
| Hamolin/FRG | Germany | 309 | 1764 | 986 | Coal | Deutsche/ Babcock | Watertube |
| Canadian Nat. Def. Base | PEI Canada | 40 | 160 | Sat | Coal | Foster/ Wheeler | Watertube |
| East Stroudsberg College | Pennsylvania | 40 | 110 | Sat | Anth. Culm | FluiDyne IBW | Watertube |
| Idaho Falls Opr. | Idaho | 17.5 | 650 | 750 | Coal | Foster Wheeler | Watertube |

similar in other mixtures if: other constituents in the mixtures do not react with the coal particles and cause a change in hardness, and coal size consist requirements of the different mixtures are the same. Based on the results of the proposed research, certain assumptions can be made concerning unexplored mixtures. However, as a means of verifying any assumption, a certain amount of explicit research will be required for other mixtures.

Question: What coal combustion research facilities at government sites will be continued?

Answer: The Pittsburgh Energy Technology Center has extensive research facilities that are being utilized in the assessment of coal-based mixture technology. The in-house research program is an integral part of the overall coal-based mixture activity and will be continued. Morgantown and Grand Forks Energy Technology Centers also have atmospheric fluidized-bed combustion test units which are used for in-house research.

## Fuel Cells

Question: What is the status of the phosphoric acid fuel cell?

— What steps have to be taken, in your opinion, before cells can be sold to utilities?

— What does the $5.0 million request for phosphoric fuel cells development permit?

Answer: It is necessary to continue the technology development of phosphoric acid fuel cells to improve system life, power density and reduce manufacturing costs prior to commercial system design and construction. After a potentially successful design concept is chosen (current areas of research include larger area cells, higher operating pressures, air, organic liquid or water cooled stacks, and various control system concepts), a prototype powerplant utilizing final design concepts must be built and tested in an operational environment to provide the necessary data regarding technical and operational characteristics such as maintainability and reliability of components and sub-systems. After completion of such testing, the primary factor that will forstall the purchase of fuel cells by interested parties will be the high capital investment required for initial commercial service units relative to conventional steam system powerplants. This will be due largely to the lack of a production base from which to spread fixed costs such as design and manufacturing facility investment. The need of a potential manufacturer to invest several hundred million dollars to create an assembly line production facility to bring the price of these fuel cells down to a competitive level with todays less efficient generators, without firm assurance of a market, remains the other unknown factor in the complex problem of fuel cell commercial introduction.

The $5.0 million request permits $1.0 million to be applied towards completion of the testing of the 4.8 Mw demonstrator in New York City and $4.0 million to complete technology development for electric utility powerplants.

Question: Why would thermionics not fit the long-term, generic criteria established by the Administration?

Answer: The thermionics program does fit the Administration's criteria for a long-term, generic technology. However, it was considered not to be of sufficiently high priority relative to other Fossil Energy programs.

The level of technology achieved to date has been shown in limited studies to be only marginally advantageous in topping a combined cycle powerplant. It may be possible, after a considerable amount of additional R&D, for thermionics to penetrate the fossil energy market in selected, limited applications, including cogeneration and gas turbine topping. However, in comparison with other technologies such as the solid oxide fuel cell program, additional Federal investment could not be justified.

## Heat Engines

Question: What is the current status of your high temperature turbine development work?

Answer: Phase II, "Technology Testing and Test Support Studies" is essentially complete. G.E. is writing the final report since all testing has been completed. Curtiss-Wright has yet to complete an aerodynamic cascade test then write a final report. Both should be complete by October 1, 1982.

Question: What are the potential benefits of high temperature turbine development?

Answer: Improved efficiencies and costs over both steam systems and today's combined cycles. Efficiencies should be 10% improved over today's combined cycles and 13% better than steam. Costs should be competitive with today's combined cycle costs and 13% better than today's steam systems.

Question: How would you evaluate the relative merits of advanced air transpiration cooling and advanced water cooling? Which is more advanced?

Answer: At this time both show promise. Several complete engines have accumulated hundreds of hours of operation using air cooling. No complete large engine has yet been operated using water cooling. However, a small water cooled turbine, approximately 1-1/2 feet in diameter, has demonstrated water cooling feasibility. All high temperature turbine technology contract water cooling development work has concentrated on component development (blade, vanes, etc.) and has not yet completed rotating, fired, hardware testing.

Question: At what stage of development are foreign competitors in high temperature technology development?

Answer: Foreign competitors are becoming increasingly active in these advanced concepts, particularly the Japanese. The "Moonlight" project might have a rotating hardware test running within one year. This project is a very complex reheat gas turbine cycle which as a turbine inlet temperature of 1300°C (2430°F), uses air cooling, and several advanced concepts.

### Great Plains Gasification Project

Question: Could you provide the Committee with copies of the first quarterly summary report on work-in-progress that was due on April 30?

Answer: Attached is a copy of the Great Plains Gasification Project Quarterly Technical Progress Report for January 1, 1982 - March 31, 1982.

### TOSCO And Union Oil Shale Projects

Question: What balance of Energy Security Reserve funds transferred to the Corporation from DOE? Did you keep any funds to monitor Great Plains?

Answer: The amount transferred to the Synthetic Fuels Corporation is as follows:

| Purchase Commitments/Price Guarantees/Loan Guarantees: | |
|---|---|
| 1. TOSCO | $1,232,900,000 |
| 2. Union | 400,000,000 |
| 3. Unobligated Balance | 1,867,100,000 |
| TOTAL | $3,500,000,000 |
| Loan Guarantees Unobligated Balance | 500,000,000 |
| TOTAL | $4,000,000,000 |

At the end of FY 1981 there was $5,789,541 available to monitor the Department of Energy program under the Energy Security Reserve. As of April 30, 1982, approximately $3,700,000 of these funds remain uncommitted. Any of these funds that remain unobligated at the end of FY 1982 may be used to monitor Great Plains in FY 1983.

### Underground Coal Gasification

Question: The request of $700,000 for in situ gasification is to monitor environmental effects on past test sites.

— How many sites does this request cover?

# GREAT PLAINS GASIFICATION PROJECT

# QUARTERLY TECHNICAL PROGRESS REPORT

FOR

JANUARY 1, 1982 - MARCH 31, 1982

Great Plains Gasification Associates
One Woodward Avenue
Detroit, Michigan 48226

Date Published - April 30, 1982

Prepared For The
United States Department Of Energy
Under Contract No. DE-FM01-82FE55014

# GREAT PLAINS GASIFICATION ASSOCIATES
# PROJECT
## QUARTERLY TECHNICAL REPORT

For the quarter ending March 31, 1982, engineering was on schedule for both the Mine and the Plant. There was no engineering and construction activity scheduled for the Pipeline.

There are no major engineering problems which would foreseeably impact the scheduled start-up date for production.

There were no major engineering changes for the quarter which would effect the technical baseline.

Engineering for the next quarter will be directed toward supporting the Summer Seasonal Construction Schedule.

## FIRST QUARTER ACCOMPLISHMENTS - SUMMARY

The first quarter of 1982 saw detailed engineering work continuing at a high level. Phase III engineering progressed past the 50% complete level and the contractor technical staffs exceeded 500 equivalent people by the end of the quarter.

Detailed engineering was ongoing in all plant areas. Shift conversion became the first process unit to reach the 90% completion level. This completion level was also surpassed for the underground and above ground piping and electrical distribution systems outside of unit battery limits and for offsite development and construction facilities.

Detailed engineering by many equipment package vendors and subcontractors continued to provide important data to the Lummus/Kaiser engineering force. Vendor engineering documentation was essentially completed (submitted, reviewed, corrected and approved) for the multi-effect evaporator (8100 Area), methanation start-up heater, product gas glycol drying unit, flare stack (8300 Area) and the major process compressors with the exception of final drawings for the lube/seal oil and instrumentation/control systems. Vendor engineering is currently in progress for the waste liquid incinerator (8100 Area), lock gas incinerator, high pressure BFW pumps, electrostatic precipitator (5000 Area), ash handling system, secondary water treatment systems, utility steam generators and oxygen plant.

Significant progress was made by Lummus/Kaiser in the areas of structural steel and above ground piping design. About 40% of all the equipment and building structural steel drawings were issued during the period including most drawings for the coal handling and major process compressor buildings. Piping design was completed in several process and utility areas; rectisol and methanation except for the compressor buildings, gas liquer separation, cooling tower, process storage, flare and waste water treatment. About 20% of all the piping isometric drawings were issued during the period with isometric production approaching the 1000 per month rate at the end of March.

Other meaningful accomplishments at Lummus/Kaiser included the finalization of the lock gas and oxygen plant plot plans, completion of the cooling tower piling design, completion of the plantwide short circuit study for electrical systems, completion of the steam generation and secondary water treatment P&ID's and evaluation of the plantwide electric heat tracing system proposals.

Parsons detailed engineering for the Sulfur Recovery Unit made good progress after staffing up their engineering force early in the period. Phase III engineering was about 30% complete at the end of the quarter. P&ID's were completed and issued, most major equipment items were requisitioned and bid tabulations prepared for the basin agitators, absorber columns and aeration blowers. Basin foundation and piperack/centrifuge building structural steel design reached the 90% complete level; piping model design was initiated.

Lurgi completed their basic design package for the gas liquer filter area and this information was issued to Lummus for detailed design.

Vendor detailed engineering was inititated for the methanol unit during this period. Flow diagrams, equipment specifications/data sheets, and physical arrangement drawings were issued for review. Piping and electrical wiring will be brought to the three vendors - supplied skid mounted units by Lummus/Kaiser.

Detailed engineering by Lurgi for the procurement of proprietary and special equipment is about 80% complete. Bid tabulations were prepared for the ash lock/coal lock/control system, ash lock hammering device, ash lock disposal chute, pressurizing/depressurizing valves and naphtha/phenosolvan extractors. Review of vendor drawings continues.

Specifications for the deepwell were prepared and issued during the period. Deepwell pipe was procured and an installation subcontractor chosen.

The requisition for the data acquisition computer system was also issued this period and the proposal was received and evaluated.

## FORECASTED SECOND QUARTER ACCOMPLISHMENTS - GENERAL

Engineering manpower is expected to remain essentially at current levels through the second quarter of 1982 with Phase III engineering progress proceeding to the 70% complete level.

Several process and utility units are expected to reach the 90% plus completion level including site development, administrative complex (0400 Area), gasification, gas cooling, phenosolvan and ammonia recovery.

About 25% of all building foundation drawings and 40% of all equipment/piperack foundation drawings will be issued during the period. This includes major compressor and compressor building foundations, equipment foundations for the ash handling, methanation and gas liquer separation/ filter areas; main stack foundation; and south end main piperack foundations. Significant efforts will be made to remove "holds" on all previously issued foundation drawings based on the finalization and structural steel and piping design and the receipt of vendor drawings.

Access road and paving drawings will be completed for most process and utility areas bringing this activity above the 90% complete level.

Detailed engineering for piping will concentrate on piping isometric production from completed piping design models for many process areas (gasification, rectisol, methanation, gas liquer separation, and waste treatment/deepwell treatment) and the completion of piping design in several other areas including the major compressor buildings, lock gas compression, gas liquer filter area, product gas compression, coal handling, sulfur recovery, steam generation, secondary water treatment and ash handling.

A major effort will be put forth to finalize the orientation for all nozzles and other appurtenances on vessels, towers and heat exchangers.

The design of above ground electrical and instrumentation systems will accelerate on a plantwide basis. About 25% of all the electrical drawings and 50% of all the instrumentation drawings will be issued during the period with concentration on the main process areas, coal handling, steam generation and secondary water treatment. Completed requisition packages will be issued for the TDC-2000 digital instrumentation for several of the process areas and secondary water treatment.

The issuance of as purchased technical packages for the sulfur recovery unit incinerator and the hydrogen storage system are scheduled for the second quarter.

The plantwide electrical relay coordination study will be issued.

Detailed design by Riley Stoker for the utility steam generators will concentrate on the finalization of electrical and combustion control systems. Detailed design by Lotepro for the oxygen plant will concentrate on the issuance of foundation and structural steel drawings and design completion for the piping within the main compressor building.

The review of vendor drawings for all areas and the witnessing of tests for major pumps/blowers and several package units will continue throughout the period.

Other engineering activity will include the clarification of specifications and drawings as requested by field personnel and the specific coordination with construction to process CCR's (construction change requests) and NCR's (non-conformance reports).

## ENGINEERING EVALUATIONS

The following engineering studies are in progress.

1 - Investigation of previous designs and design criteria for the process pond liner systems including the underdrain and venting provisions, liner materials and allowable permeability. The study is expected to be completed in May and provide input to the pond liner specifications and drawings which will be issued towards the end of the second quarter.

2 - Investigations of alternatives for treatment and disposal of the bleedstream from the sulfur recovery unit. Evaporation, chemical treatment, crystallization and landfill designs are in the process of evaluation. The mixing of this stream with other in-plant waste streams is also being investigated. The offerings from equipment manufacturers and the experiences of other operating sulfur recovery facilities are being investigated. Final resolution is expected during the second quarter with the issuance of preliminary process flow diagrams and system/equipment descriptions.

3 - Water flow balances for the wastewater treatment and gasifier ash sluiceway system are being evaluated during partial or unusual operating conditions. Completion of this study during the second quarter will determine if an additional storage pond is necessary. Plot space for this pond has been pre-selected should it be required.

4 - Investigation to verify that all systems and hardware needed to insure the integrity of the utility steam generation during a total plant electrical power failure have been included in the detailed design. Any inadequacies uncovered will be rectified.

5 - Investigation to verify that adequate design margins have been incorporated into building heating systems and steam tracing systems. The application of design criteria/specifications will be reviewed and any inadequacies rectified.

6 - Investigation of materials for the fabric seal for lock gas holder. Research is intended to identify materials which can maximize time periods between repair/replacement. Testing of materials at Sasol is planned. Conclusions will be forwarded to the lock gas holder fabricator.

7 - Investigation of alternatives for the final disposal of drainage from maintenance and process buildings located west of the railroad. All waste water treatment systems are located east of the railroad and topography inhibits gravity flows. Dedicated sumps and pumped systems are being evaluated. Resolution is expected during the second quarter so that final sumps and piping drawings can be issued.

8 - Utility balances for all plantwide systems need to be updated for compatibility with the latest detailed design data and vendor data. This must be accomplished for fuels, air nitrogen, steam, steam condensate, cooling water, secondary treated water, boiler feedwater and wastewater. These balances are necessary to verify that the systems designed are adequate and that any future design or operating modifications have a basis for evaluation. Work on all balances is expected during the second quarter with issues made for steam, cooling water and wastewater.

GREAT PLAINS GASIFICATION PROJECT
CONTRACT NO. DE-FM01-82FE55014

## PROBLEM AREAS - SUMMARY

The difficult task which lies ahead in the second quarter is the production and issuance of AFC drawings (specifically foundation drawings and piping isometrics) to support 1982 construction program including the removal of "holds" on previously issued drawings. The home office engineering forces have increased by 15% since the beginning of 1982 and design completion priorities have been detailed to fit construction requirements. The vendor information needed for design completions is being expedited. Problems which arise due to detailed thermal or vibration analysis and interferences uncovered which affect previously issued drawings must be solved expediently. Decisions on design alternatives will be made promptly. Many of the specific detailed design problem areas listed below are associated with satisfying construction requirements on a timely basis. This is viewed as a normal project difficulty recognizing that detailed design is accomplished from the top down while construction proceeds from the bottom up, but one of added complexity when dealing with a super size project on a fast track schedule.

X a) The issuance and finalization of vendor design documents and drawings for the lock gas incinerator (purchased near the end of the first quarter), the sulfur recovery unit incinerator and the hydrogen storage system (to be purchased during the second quarter) are urgently needed in order to complete detailed design for the areas surrounding these equipment packages.

b) The issuance and finalization of vendor drawings for electrical transformers, switchgear and motor control centers is urgently needed so that "holds" on electrical substation building drawings can be removed.

c) The issuance and finalization of vendor documents and drawings for the methanol unit is urgently needed not only to complete detailed engineering for the 4900 Area but for finalization of the piperack piping design for the adjacent product gas compression unit.

d) Coordination of the process compressor foundation design for the rectisol methanation areas and product gas compressor with the surrounding equipment/piping and the adjacent building wall foundation design. Building layouts previously issued have little space flexibility and have reduced the number of design options available for these large compressor foundations.

e). To support 1982 construction program early identification, design completion and procurement release is needed for a variety piping components including unusual size or wall thickness carbon steel pipe and fittings, low alloy and stainless steel pipe and fittings, and large block/control and safety valves.

GREAT PLAINS GASIFICATION PROJECT
CONTRACT NO. DE-FM01-82FE55014

## TECHNICAL BASELINE CHANGES

There are no technical baseline changes proposed or under study at this time.

## AREA 0200 SITE DEVELOPMENT

### 1st Quarter Accomplishments

Underground piping and road design was reviewed in accordance with the latest oxygen plant plot plan. Revised drawings were issued relocating some piping and roads in this area.

Drawings were issued showing the inlet and outlet structure details for the storm retention pond.

Based on road axle loadings for the special ash/coal lock fork lift truck the design of the road from the gasifier building to the maintenance shop was reviewed. Revised drawings were issued increasing road concrete thickness and strengthening manholes.

### 2nd Quarter Forecast

Underground piping and paving drawings will be issued after the final location and size for the laboratory building is established.

Underground piping drawings in the south pond area will be issued.

## AREA 0300 OFFSITE DEVELOPMENT

### 1st Quarter Accomplishments

Detailed engineering work is essentially complete. Engineering is interfacing with construction personnel on field questions.

### 2nd Quarter Forecast

No detailed engineering work is planned.

## AREA 0400 BUILDING

### 1st Quarter Accomplishments

Interior architectual, structural steel, electrical and HVAC drawings were issued for the Administration Building and Maintenance Shop. HVAC drawings were issued for the Vehicle Maintenance Shop. The technical bid packages (architectual, HVAC/mechanical, electrical) were prepared for the interior of the Administration Building.

Interior architectural drawings were issued for the Vehicle Maintenance Building. Work was initiated on the detailed design for the Change House.

## 2nd Quarter Forecast

Maintenance Shop equipment will be selected such that work can proceed on foundations within the Maintenance Shop. The technical bid packages (architectual, HVAC/mechanical, electrical) will be prepared for the Maintenance Shop.

Exterior architectual, structural steel and foundation drawings will be issued for the Change House. Interior design will be initiated.

Laboratory Building detailed design will be initiated. Structural steel and exterior architectual drawings will be issued.

## 0600 SITE PREPARATION

### First Quarter Accomplishments

Road and drainage drawings for all process means were issued in March.

### Second Quarter Forecast

No detailed engineering work is planned.

## 0700 BUILDINGS

### 1st Quarter Accomplishments

Exterior architectural and structural steel drawings were issued for the gas cooling, rectisol, methanation and product gas compression compressor buildings. HVAC drawings were issued for the gas cooling and product gas compression buildings. Design work is in progress for the interior mechanical and electrical portions fo these four compressor buildings.

Foundation design for these four compressor buildings is in progress. The design must consider the non-uniform distribution of the wind loads from the siding into the structural steel. Due to close spacing between the compressors and the building wall, the building foundation design must be coordinated with the compressor foundation design.

Detailed design was initiated for the Blower Building (1600 Area).

## 2nd Quarter Forecast

HVAC drawings will be issued for the rectisol and methanation compressor building.

Foundation, interior architectural and electrical drawings will be issued for the gas cooling, rectisol, methanation and product gas compression buildings.

Foundation, exterior architectural and structural steel drawings will be issued for the lock gas compression compressor building, ammonia storage refrigeration system building, and Blower Building (1600 Area).

An engineering study will be completed to determine whether or not the rectisol compressor building can be erected without some of the roof panels, allowing for a late 1982 delivery of the compressors and drivers.

Vendor drawings from electrical manufacturers will be issued and will allow the removal of all holds on the electrical substations.

## AREA 1100 GASIFICATION

### 1st Quarter Accomplishments

Isometric piping drawing production is moving forward at full speed. More than 600 isometric drawings were released during the quarter.

About half of all the above ground electrical drawings were issued.

Instrumentation piping design is in progress.

Final vendor drawings for the Lurgi supplied hydraulic and lubrication systems were issued.

Large crude gas control and block valves around the waste heat exchangers and at the unit battery limits were selected.

### 2nd Quarter Forecast

All piping isometric drawings and instrumentation drawings will be issued during the period.

All electrical drawings except for those associated with HVAC systems and the upper coal conveyor portion of the building will be issued during the period.

## AREA 1180 LOCK GAS COMPRESSION

### 1st Quarter Accomplishments

Detailed engineering work was delayed by revisions to the plot plan. This was caused by the need for a larger plot space for the lock gas incinerator, the addition of an incinerator by-pass flare and some growth of compressor and MCC buildings which required a slight shift of the lock gas holder location. The plot plan has now been revised and reissued.

The P & ID's are being revised to incorporate the new incinerator flare but cannot be finalized until the vendor flow diagrams for the incinerator are received and reviewed.

A 30% (equipment arrangement) piping model review was held in March.

### 2nd Quarter Forecast

Equipment and piperack foundation structural steel, and above ground piping design will progress to the 85-90% completion level.

A 60% piping design model review will be held.

About ground electrical and instrumentation design will be initiated.

As purchased surge tank and K.O. drum drawings will be issued.

## AREA 1200 SHIFT CONVERSION

### 1st Quarter Accomplishments

Piping isometric, paving, foundation, electrical and instrumentation drawings were all issued complete during the first quarter.

### 2nd Quarter Forecast

No detailed engineering work is planned.

## AREA 1300 GAS COOLING

### 1st Quarter Accomplishments

Piping isometric drawings were issued complete except for the converted gas compressor area.

A 60% piping model review was held for the compressor area.

All structural steel drawings were issued except for the compressor area.

Above ground electrical drawings for the raw gas area were issued complete.

2nd Quarter Forecast

Instrumentation drawings and compressor area foundation and structural steel drawings will be issued complete.

A final piping design model review will be held and piping isometric drawings for the compressor area will reach the 85-90% complete level.

Above ground electrical drawings for the converted gas area will be issued.

## AREA 1400 RECTISOL

1st Quarter Accomplishments

Foundation and structural steel drawings except for miscellaneous platforms were issued complete excluding the compressor area.

Twenty vessel tower and heat exchanger drawings were issued as purchased. This activity is 100% complete.

Above ground electrical design was initiated and is about 15% complete.

A 100% piping design model review was held for Trains A and B in February. A 60% piping design model review was held for the compressor area in March.

Piping isometric drawing production proceeded for the common train and is about 80% complete. Piping isometric drawings are about 10% complete for Trains A and B.

2nd Quarter Forecast

Foundation and structural steel drawings will be issued for the compressor area. All miscellaneous platform drawings will be issued.

Final paving and road drawings will be issued.

Piping isometric drawings will be issued complete for the Common Area and Trains A and B.

The 100% piping model review for the compressor area will be held. Piping isometric drawings for the compressor area will reach the 90% complete stage.

Underground electrical drawings will be issued for the compressor area.

Above ground electrical and instrumentation drawings will be issued complete except for the compressor area.

## AREA 1600 PHENOSOLVAN

### 1st Quarter Accomplishments

Eleven vessel and pump drawings were issued completing this activity.

The last structural steel drawing was issued.

All three of the required instrumentation drawings were issued.

Electrical design is about 50% complete with five drawings issued for the period.

The 100% piping model review was completed for the remaining portion of the unit (the blower building).

Over fifty percent of the piping isometric drawings were issued with overall isometric drawing production now 75% complete.

### 2nd Quarter Forecast

Paving above ground electrical and piping isometric drawings will be issued 100% complete.

## AREA 1700 METHANATION

### 1st Quarter Accomplishments

Equipment drawings were issued for the vessels and reactors completing this activity.

All foundation and structural steel drawings were issued except for the compressor area.

The two required underground piping drawings for the area were issued.

The 100% piping model review was completed except for the compressor area.

The 60% piping model review for the compressor area was held.

2nd Quarter Forecast

Compressor area piping design will proceed to the 95% complete level.

Isometric piping drawing production will be initiated and completed during the second quarter except for the compressor area.

Compressor area foundation and structural steel drawings will be issued.

All area paving drawings will be issued.

Instrumentation and electrical drawings except for the compressor area will be complete.

## AREA 1800 GAS LIQUOR SEPARATION

1st Quarter Accomplishments

Revised plot plans based on the 60% piping model review comments were issued.

About 80% of the structural steel drawings and 50% of the foundation drawings were issued.

Final drawings were issued for the Lummus designed tar separators and final drawings were received for the Lurgi designed tar separators.

The 100% piping model review was held on March.

2nd Quarter Forecast

Structural steel, foundation and paving drawings will be issued 100% complete.

Piping isometric production will be initiated and completed during the second quarter.

About 75% of the electrical and instrumentation drawings will be issued during the period.

## AREA 1800 GAS LIQUOR FILTER

### 1st Quarter Accomplishments

The basic engineering package issued to Lummus by Lurgi during the first quarter.

The filter vessels will be supplied by Lurgi and the remaining equipment (tanks, pumps, scrubber) will be supplied by Lummus. Lummus will perform all other detailed engineering.

Plot plan, P & ID and equipment data sheet preparation was initiated by Lummus in March.

Foundation drawings for the two large gas liquor storage tanks were issued.

### 2nd Quarter Forecast

All plot plans, P & ID's, equipment data sheets/drawings and underground piping drawings will be issued complete.

Foundation, structural steel, and above ground piping design are expected to reach the 75% completion level.

## AREA 1900 PRODUCT GAS COMPRESSION

### 1st Quarter Accomplishments

Plot plans and all vessel and heat exchanger drawings were issued.

Civil and structural steel drawings are 90% complete but drawings were not issued pending receipt of vendor information for the glycol drying unit and the adjacent Methanol Area.

The 60% piping model review for the glycol drying and compressor area was held in February. Although piperack piping design is almost complete, model review was held pending receipt of information from vendors.

## 2nd Quarter Forecast

Methanol unit piping and electrical information needed for finalizing the product gas compression unit detailed engineering will be received in April.

All foundation, structural steel and paving drawings will be issued.

Compressor area piping design will proceed to the 95% complete level. Isometric piping drawing production will be initiated and completed during the second quarter except for the compressor area.

Electrical and instrumentation design will be initiated with about 75% completion expected.

## AREA 2000 COAL PREPARATION/HANDLING

## 1st Quarter Accomplishments

Foundation drawings issued for fines silos.

Structural steel drawings were issued for all buildings and transfer towers.

Thirty-nine bin, chute and vessel drawings were issued completing this activity.

Architectural and HVAC drawings were issued for secondary crusher and live coal storage buildings.

Six orthographic piping drawings and 38 piping isometric drawings were issued including those for the coal galleries. This activity is about 60% complete.

Above ground electrical drawings were issued for all building bringing this activity to about 80% complete.

Instrumentation drawings were issued for the secondary crusher and line coal storage areas.

Dust Collector duct routing drawings are in progress and are about 50% complete.

Fire alarm and detection system drawings were issued.

Specifications and technical bid packages were issued for fluid drive clutches, conveyor belting, splitters, divertors and slide gates.

## 2nd Quarter Forecast

Foundation drawings will be issued for the transfer towers completing this activity.

All miscellaneous steel and platform drawings will be issued completing this activity.

Architectural and HVAC drawings will be issued for the conveyor galleries and secondary sampling building completing this activity.

Orthographic piping, above and underground electrical and instrumentation drawings will be issued completing this activity.

Isometric piping drawing production will continue with a 75% completion level expected by the end of the quarter.

## AREA 3000 OXYGEN PLANT

## 1st Quarter Accomplishments

With the exception of substation 15 which is designed by Kaiser, all other portions of the 3000 area have been subcontracted on a turnkey (design, purchase, install) basis.

The only drawing issued by Kaiser engineers for substation 15 was the one line electrical diagram. As purchased specifications were issued for switchgear were issued for this substation. Coordination with Basin Electric because of the physical ties between this substation and the Basin supplied main transformers is necessary and is continuing.

Oxygen plant detailed engineering is about 38% complete. All major heat exchangers, columns, vessels, pumps and plant/instrument air compressors were placed on order after review of and approval of drawings and specifications.

Instrumentation and electrical systems are being coordinated with the subcontractor.

2nd Quarter Forecast

All substation 15 architectural and electrical drawings will be issued completing the design of this building.

The remaining minor oxygen plant equipment will be placed on order.

Vendor P & ID's, foundation, structural steel and compressor building drawings will be reviewed and finalized.

Based on obtaining the final vendor motor list and motor characteristics the electrical coordination between the oxygen plant and Substation 15 will be finalized.

## AREA 4000 SULFUR RECOVERY

After officially kicking off detailed engineering at Ralph M. Parsons in the fourth quarter of 1981 significant engineering progress was made in the first quarter of 1982. Detailed engineering progressed from about 5% to 30% complete.

Final P & ID's and materials diagrams were issued.

Ninety percent of the vessel, rotating equipment, fired heater and heat exchanger specifications and data sheets were issued and technical requisitions prepared. Proposals have been evaluated and bid analysis completed for about half the major equipment.

Structural steel drawings are 90% complete for the piperack and centrifuge building.

Concrete basin drawings were issued and foundation design has begun for the centrifuge building, piperack and major vessels.

Piping design was initiated and is about 10% complete.

Instrument and electrical design has begun. Data sheets for control valves and safety valves were issued.

2nd Quarter Forecast

As purchased equipment specifications and data sheets will be issued for about 75% of the major equipment items.

The 30% and 60% piping design model reviews will occur in the second quarter.

Structural steel drawings will be issued 100% complete.

Foundation drawing completion will be dependent in many cases on the availability of vendor drawings and is expected to be approximately 50% complete.

Electrical and instrumentation drawings will be about 50% complete by the end of the quarter.

Vendor drawings will be finalized for all major rotating equipment items.

## AREA 4600 AMMONIA RECOVERY

### 1st Quarter Accomplishments

Final paving drawing was issued.

The as purchased drawing for the superstill was issued. Equipment drawings are now 100% complete.

About 100 piping isometric drawings were issued during the period with isometric production now about 65% complete. Isometric production was somewhat less than anticipated due to higher priority piping design work in other units.

Instrumentation drawings are complete.

Above ground electrical drawings are about 50% complete.

### 2nd Quarter Forecast

All piping isometric and above ground electrical drawings will be issued.

Foundation drawings for four horizontal vessels will be issued.

## AREA 4900 METHANOL

### 1st Quarter Accomplishments

The purchased specifications for this multi-skid package unit was issued. PFD's, P & ID's equipment data sheets and equipment arrangement drawings were reviewed and comments issued.

2nd Quarter Forecast

Final PFD's, P & ID's equipment data sheets, equipment arrangement drawings and electrical and instrumentation diagrams and drawings will be issued.

## AREA 5000 STEAM SUPPLY AND DISTRIBUTION

1st Quarter Accomplishments

As purchased specifications were issued for the electrostatic precipitator, the last major equipment to be purchased.

Piping isometric, electrical and instrumentation drawings were issued complete for the dearator area.

2nd Quarter Forecast

Foundation and structural steel drawings for pipe racks tanks, precipatator and ductwork in the superheater area will be issued complete.

Piping isometric and ductwork in the superheater area will be 80% completed.

Electrical and instrumentation work for the superheater area will be about 50% complete.

## AREA 5100 STEAM SUPPLY

1st Quarter Accomplishments

Boiler house structural steel, architectural and HVAC drawings were issued complete.

As purchased specifications and drawings were issued for the dearator, blowdown tanks, boiler feedwater pumps and heat exchangers.

Technical packages were issued for requisition for the chemical treatment systems and main stack.

Vendor drawings/documents for the steam generator are being reviewed on a continuous basis. Detailed engineering by Riley is about 35% complete.

P & ID's were reissued based on vendor information, however, the steam generator control system details are not finalized.

Piperack structural steel drawings were issued.

Twelve piping orthographic drawings were issued for the piperack.

2nd Quarter Forecast

As purchased specifications will be issued for the chemical treatment systems and main stack.

Review of vendor drawings will continue. Riley electrical and instrumentation drawings should be 60-65% complete by the end of the quarter. Feedwater pump drawings will be finalized.

Finalized P & ID's will be issued.

All piperack and equipment foundation drawings will be issued.

Flue design will be 50% complete.

Orthographic piping drawings will be 75% complete and isometric piping drawings about 40% complete.

Electrical and instrumentation design will be about 50% complete with 17 drawings issued during the period.

## AREA 5200 ELECTRICAL DISTRIBUTION

### 1st Quarter Accomplishments

No detailed engineering work was performed during the first quarter.

### 2nd Quarter Forecast

Design for the digital control system wiring will be initiated and about 50% completion is expected.

## AREA 5300 ELECTRICAL SUPPLY AND DISTRIBUTION

### 1st Quarter Accomplishments

Ten drawings were issued in the first quarter bringing drawing completion to about 90%. Equipment arrangement drawings were issued for substations 11, 12, 14 and 17. Raceway and one line diagrams were issued for substations 11 and 14.

Plantwide electrical short circuit studies were issued.

Coordination with Basin Electric continued relative to electrical supply.

2nd Quarter Forecast

All remaining electrical drawings will be issued.

Electrical relay coordination study will be issued.

Coordination with Basin Electric will continue.

## AREA 5400 SECONDARY WATER TREATMENT

Vendor drawings/documents are being reviewed and finalized including P & ID's. As purchased drawings/specifications and data sheets were issued for water and chemical storage tanks, chemical pumps and analyzer systems. The technical package for the firewater pump and driver requisition was issued.

All equipment plot plans and general arrangement drawings were issued.

Water treatment building structural steel drawings were issued complete. Piperack structural steel design was 75% complete.

Foundation drawings for all outdoor tanks and the neutralization pit were issued.

Electrical design is about 50% complete.

2nd Quarter Forecast

Finalized P & ID's will be issued.

As purchased specifications and data sheets will be issued for the large water pumps and drivers and for the fire water pumps.

Foundation drawings will be issued for the Water Treatment Building and the Fire Pump House and the remaining piperacks.

All miscellaneous steel platform and support drawings will be issued.

HVAC and electrical drawings will be issued for the Water Treatment Building and the Fire Pump House.

Above ground piping design, above ground electrical, design and instrumentation design will increase to about 50% complete for the unit as whole.

Vendor drawings and document review will continue at a high level throughout the period.

## AREA 5500 - COOLING TOWER

### 1st Quarter Accomplishments

All piling and foundation drawings were issued with the exception of the foundation drawings for one sump pump and a small group of piperack columns.

Hydraulic model studies for the cooling tower basin and sump were completed.

The 60% and 100% piping model reviews were completed.

### 2nd Quarter Forecast

The as purchased drawing will be issued for one chemical storage tank and the as purchased data sheet for one sump pump.

The final two paving drawings and the final three foundation drawings will be issued.

All structural steel and underground electrical drawings will be completed and issued.

Piping isometric production will be initiated and completed in the second quarter.

## AREA 6000 - PROCESS STORAGE FACILITIES

### 1st Quarter Accomplishments

Final P & ID's were issued after the incorporation of vendor information for the ammonia storage refrigeration system.

The as purchased IPE/Methanol unloading pump data sheet was issued.

Piping design was completed with the simultaneous issuance of all twelve orthographic piping drawings in February.

Eight vessel and heat exchanger drawings were issued completing this activity.

Foundation drawings were completed and issued for all field erected tanks.

Electrical and instrumentation detailed design was initiated.

### 2nd Quarter Forecast

Pump, piperack and sleeperway foundation drawings and paving drawings will be issued.

Above and below ground electrical and instrumentation detailed design will be at the 75% complete level with about 50% of the drawings issued.

## AREA 7000 INTERCONNECTING PIPE

### 1st Quarter Accomplishments

Engineering drawings are complete.

Technical packages were prepared for requisitioning manholes, hydrants, miscellaneous valves and prestressed concrete cylinder pipe.

Detailed engineering work is essentially complete.

### 2nd Quarter

No detailed engineering work is planned. Engineering will interface with construction personnel on field questions.

## AREA 7100 INTERCONNECTING PIPING

### 1st Quarter Accomplishments

One paving and one miscellaneous steel drawing were issued.

Six Steam tracing drawings were issued which completed all above ground piping drawings.

### 2nd Quarter Forecast

One paving drawing and eighteen underground electrical drawings for the south end of the main piperack will be issued.

All drawings will be issued complete by the end of the second quqrter.

## AREA 8100/8600 WASTE EFFLUENT/DEEPWELL TREATMENT

### 1st Quarter Accomplishments

Issued plot plan for tankage area.

Issued outdoor pumps, API separator and piperack foundation drawings and piperack structural steel drawings.

Issued piperack and tankage area orthographic piping drawings.

The piping design model which is used only for piping within the 8100/8600 process building had its 100% model review. About 25% of the piping isometric drawings within the process building were issued.

The as purchased requisition for the liquid waste incinerator was issued.

### 2nd Quarter Forecast

Finalize vendor drawings/documents for the waste liquid incinerator.

Issue foundation drawings for sleeperway, storage tanks, oily water pond and incinerator.

Issue piping isometric drawings for all piping within the process building and for the piperack/tankage area.

Prepare and issue specification for deepwell, cooling tower, multi-effect evaporator and incinerator pond liner systems.

Initiate design for sleeperway piping.

Issue above ground electrical and instrumentation drawings for the process building, piperack/tankage area and API separator area.

Initiate electrical and instrumentation design for pond area.

## AREA 8200 ASH DISPOSAL

### 1st Quarter Accomplishments

Vendor drawings/documents for the ash disposal system were issued, reviewed and returned with comments.

Specifications were issued for isolation dampers and blast gates and are in preparation for centrifugal separator/filters.

Ash sump building and scrubber building architectural and structural drawings were issued. HVAC design for this building was 50% complete.

General arrangement and mechancial ash handling drawings were revised in accordance with vendor data and reissued.

Piping design for the ash sump and scrubber areas was initiated and four of the 29 planned orthographic piping drawings were issued. Instrumentation design is about 25% complete for these areas.

### 2nd Quarter Forecast

Orthographic piping, HVAC, instrumentation, and electrical drawings will be issued complete for the scrubber and ash sump buildings. Piping isometric drawings will be 10-15% complete.

Structural steel drawings will be issued for the piperack and dewatering bin area.

Piping, architectural, HVAC, electrical and instrument design will be about 50% completed for the dewatering bin area.

## AREA 8300 FLARE SYSTEM

### 1st Quarter Accomplishments

Above and below ground electrical drawings were issued complete.

Below ground piping drawings were issued complete.

The 100% piping model review was held, Isometric piping drawing production proceeded to the 80% complete level.

2nd Quarter Forecast

Issue as purchased drawings for the flare knockout drums,

Issue the last 20 piping isometric drawings.

## AREA 8400 SEWAGE TREATMENT PLANT

### 1st Quarter Accomplishments

As purchased specifications, data sheets and drawings were issued for the packaged sanitary treatment plant, surge tanks, holding tanks, lift station pumps and transfer pumps.

Foundation and architectural drawings were issued for the Sewage Treatment Building.

Electrical design was initiated.

### 2nd Quarter Forecast

All Sewage Treatment Building mechanical and electrical drawings will be issued completing drawing issuance for this unit.

## AREA 8500 RAW WATER PUMPS

### 1st Quarter Accomplishments

The raw water pumps located at the raw water intake on Lake Sakakawea are to be engineered, procured and installed by Basin Electric. Approval was transmitted to Basin Electric during the fourth quarter of 1982 to proceed with the procurement of these pumps.

During the first quarter the specifications and technical requisitions was prepared for these pumps.

2nd Quarter Forecast

Pump proposals will be reviewed and it is expected that purchase award will be made. It will be necessary to check pump characteristics with the pump sump hydraulic test results conducted earlier prior to purchase award.

## AREA 9533 DEEPWELL

1st Quarter Accomplishments

Technical specifications were prepared and issued with the subcontract requisition. Proposals were reviewed and the as purchased technical specifications were prepared and issued.

Technical specifications were prepared for well piping and fittings. Proposals were reviewed and the as purchased technical specifications were prepared and issued.

Detailed engineering is complete.

2nd Quarter Forecast

No detailed engineering work is planned.

Engineering will interface with construction personnel on field questions.

# GREAT PLAINS GASIFICATION ASSOCIATES
# FREEDOM MINE DEVELOPMENT
# QUARTERLY TECHNICAL REPORT

## BACKGROUND

Through January, 1982, The Coteau Properties Company, as directed by ANG, continued mine development engineering activities toward the design of a 5.2 million ton per year mine fulfilling the projected annual coal requirements of Basin Electric exclusively. ANG also directed Coteau to initiate certain mine development activities, e.g. environmental work related to future mining permit applications, acquisition of land necessary to expand mine development, as well as initial engineering for Great Plains' future solid waste disposal. These activities were considered strategic to the timely development of a 9.9 million ton per year mine and were authorized in anticipation of the project loan guarantee, and financing finalization.

On Friday, January 29, 1982, Great Plains Gasification Associates and the United States Department of Energy executed the loan guarantee agreement providing for the construction and operation of Great Plains' coal gasification project. ANG formally notified Coteau February 4, 1982 to initiate mine development activities for a 9.9 million ton per year mine supplying the annual lignite requirements of both the Basin Electric and Great Plains' projects. Through the remainder of the first quarter, 1982, Coteau engineering efforts have been directed toward providing initial coal deliveries to Basin Electric and Great Plains, March 1, 1983 and March 1, 1984 respectively.

## WORK ACCOMPLISHED

a) Continued environmental engineering related to future mining permit applications to encompass mine development areas beyond the boundaries of the existing Mining Permit "A", approved and issued by the NDPSC October, 1981.

b) Finalized initial coal production pit and electrical system layouts for the initial area to be mined within Mine Area #4 South.

c) Finalized topsoil/subsoil stockpile, as well as surface water control pond plans related to road construction and coal production planning.

d) Finalized initial coal haulage and access road designs within Mine Area #4 South.

e) Completed design/construction specifications for the mine service complex scheduled for construction June, 1982 through July, 1983.

f) Continued equipment specification development for mining equipment scheduled for delivery in late 1982 and 1983. These efforts included the option selection for Dragline "B", specification development for the initial coal loading shovel, as well as the selection of additional mine construction and operating equipment, e.g. bulldozers, tractor-scrapers, cable movers, utility equipment and electrical distribution equipment.

g) Completed preliminary design of Great Plains' solid waste disposal site to be located within a mined out area of Mine Area #4 South.

At the conclusion of the first quarter, 1982, Coteau's engineering activities for developing the 9.9 million ton per year Freedom Mine, including permitting, are on schedule to meet the aforementioned initial coal delivery dates.

## PROBLEM AREAS

None.

## MAJOR ENGINEERING CHANGES

None.

## WORK PROJECTED FOR NEXT QUARTER

Coteau engineering activities for the second quarter, 1982 will continue to be directed toward many of the above areas including; mining permit application preparation, future mine planning (pit and electrical system configurations), mine reclamation engineering, and equipment selection.

## Quarterly Environmental Report

## Great Plains Gasification Project

A. Environmental, health and safety-related permits, authorizations, certificates, approvals, consents and applications which were received, submitted or filed between January 1, 1982 and March 30, 1982.

   1. Filed January 22, 1982 - Underground Injection Control Permit Application - North Dakota State Department of Health.

B. Environmental compliance problems and experience between January 1, 1982 and March 30, 1982 in construction or operation of the facilities.

   1. During the above period, no environmental problems were encountered in the construction of the project. There were no violations of project permit conditions or environmental laws or regulations. No citations or correspondence was received with regard to environmental non-compliance.

C. Delays in obtaining required environmental permit, authorization, certificate, approval or consent.

   1. There have been no delays during the period in obtaining environmental permits, etc. for the project. The underground Injection Control Permit was issued in the minimum allowable time due to close cooperation and communication between Great Plains and the State and local review agencies.

D. List of Environmental monitoring tests to be performed during the period of April 1, 1982 to June 30, 1982.

   1. No performance tests of pollution control equipment are to be performed during the period.

2. Baseline water quality samples will be taken from monitoring wells surrounding the ash disposal site, the hazardous waste site and the deepwell.
3. Environmental tests associated with the construction of the deepwell will be performed as the well is drilled in April and May. This includes drill stem tests, well logging, core testing and fluid compatibility.
4. Ambient air monitoring will be performed through the Regional Air Monitoring Program (RAMP) owned and operated by Basin Electric Power Cooperative and Montana Dakota Utilities. It is expected that Great Plains will become a one-third member of RAMP during the period.
5. The in-stream water monitoring program will be reinstituted during the period.
6. Meteorological monitoring will continue at the Great Plains weather tower.

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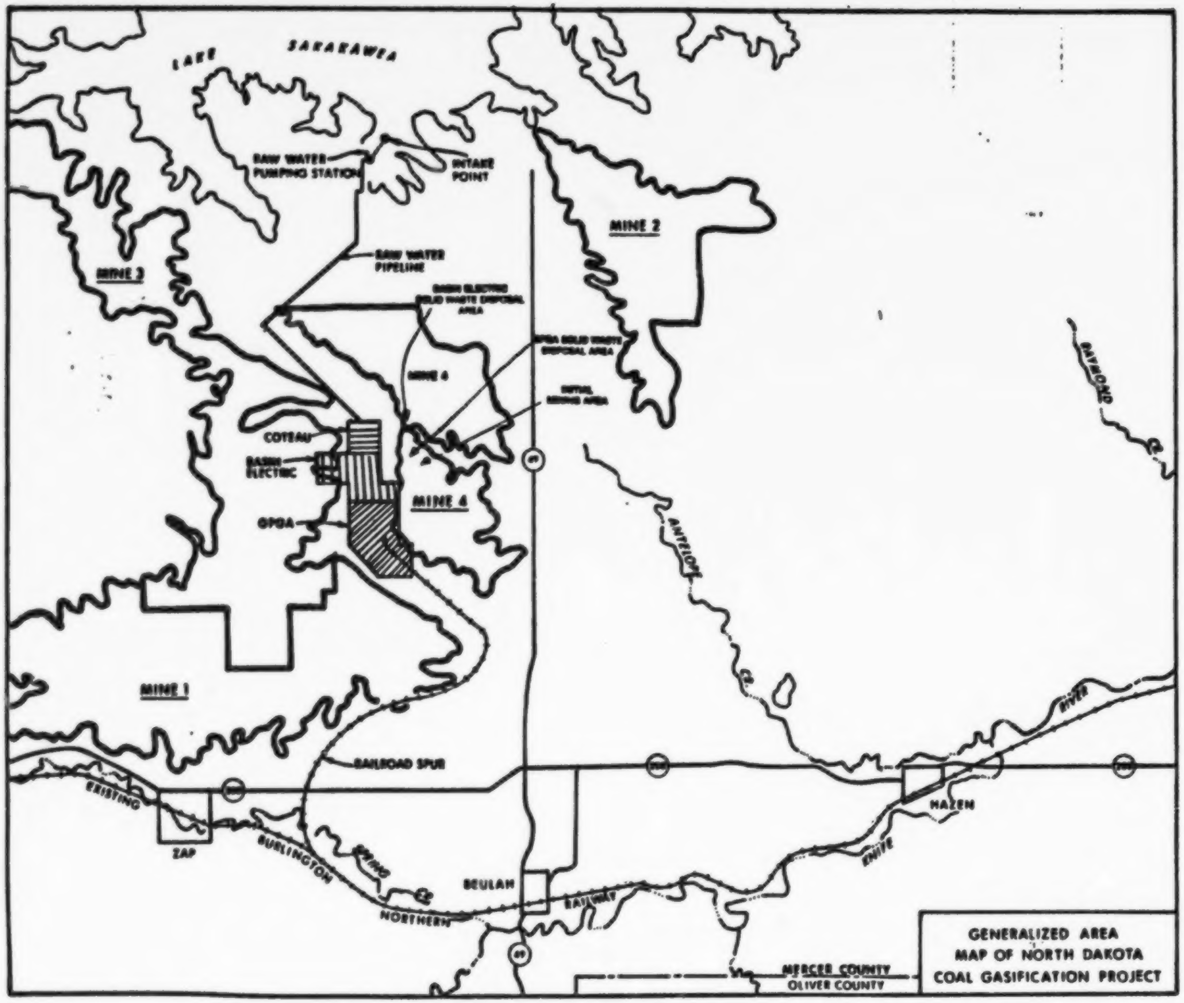
LAKE SAKAKAWEA
RAW WATER PUMPING STATION
INTAKE POINT
MINE 2
MINE 3
RAW WATER PIPELINE
BASIN ELECTRIC SOLID WASTE DISPOSAL AREA
GPGA SOLID WASTE DISPOSAL AREA
MINE 4
INITIAL MINING AREA
COTEAU
BASIN ELECTRIC
GPGA
MINE 4
RAYMOND
ANTELOPE
MINE 1
RAILROAD SPUR
EXISTING
ZAP
BURLINGTON
NORTHERN
RAILWAY
SPRING CR.
BEULAH
HAZEN
KNIFE
RIVER
MERCER COUNTY
OLIVER COUNTY

GENERALIZED AREA
MAP OF NORTH DAKOTA
COAL GASIFICATION PROJECT

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Answer: The locations of field tests covered by the request for $700,000 and the number of tests within each site that must be monitored are as follows:

| | |
|---|---|
| Hanna, Wyoming | 5 separate module tests |
| Hoe Creek, Wyoming | 3 separate module tests |
| Rawlins, Wyoming | 2 separate module tests |
| Pricetown, West Virginia | 1 module test |
| Centralia, Washington | 5 large block tests |

Environmental work at the two Rawlins, Wyoming tests are the responsibility of Gulf Research and Development Company, but with DOE oversight. It is probable that the State of West Virginia will relieve DOE of the environmental responsibility for the Pricetown site. A contigency fund remains until this is firm. The owner of the Centralia, Washington site wants to take over the environmental responsibility for this site. A contingency fund also remains for Centralia until such responsibility is legally transferred.

## Magnetohydrodynamics

Question: TRW was to work on a coal combustor for the MHD program.

— How far along has work on that combustor progressed?

Answer: The competitively awarded MHD combustor development program has met all of its performance targets and milestones set to date, specifically:

- A 10 MWt scale combustor was designed, built, and successfully operated.
- The 10 MWt design was used as a basis for designing, building, and successfully operating a 20 MWt scale coal combustor.
- The preliminary design for a 50 MWt scale coal combustor has just been completed and the Preliminary Design Review was held in April. The Critical Design Review probably will not be accomplished this fiscal year.
- After several hundred cumulative hours of testing on the 10 and 20 MWt coal combustors no life limiting phenomena has been observed and all performance targets have been obtained — e g., low heat loss, 70% slag rejection, high carbon burnout, etc.

Question: Your budget justification (p.66) states that other alternative electricity technologies will be ready for commercial introduction much earlier than MHD.

— What does this mean with regard to the likelihood of MHD technology being accepted?

Answer: It is axiomatic that the sooner a new technology is available the greater is its potential for early market penetration. However, the issue of utility baseload market penetration is quite complex. Industrialists often speak of a market window for a given technology, a period during which it may appear so attractive that it is swept into significant use relatively smoothly and rapidly. But this concept may not be directly applicable to mature industries like electric power utilities where the rate at which a technology gains wide spread applications is usually very slow. According to EPRI (ref: EPRI Journal, April 1980), recent experience shows that the time required for a new technology to achieve significant use in the electric power industry is now roughly 30-40 years. Even if all new orders for new equipment are suddenly shifted in favor of the new technology, market penetration lags because new plants take a long time to build, old ones take even longer to wear out and no one can accurately stretch the capital expansion curve for the electric utility industry. Furthermore, when the new technology involves fundamentally different methods of operation and maintenance, development of vital support systems requires another major commitment of time and expense. Finally, it must be remembered that the demand for new coal technologies is inexorably linked to coal market conditions which are sensitive to oil prices, severance taxes, labor costs, rail rates and air quality.

One could expect that the early new technologies will prove to be more attractive than competing conventional forms. Although prudent utility planners will continue to consider all available technologies, the successful early demonstration of early new technologies, could tend to delay the commercialization of technologies, like MHD, that enter the market later and may have to await the beginning of a new capital expansion cycle.

## Mining Research and Development

Question: The FY 1983 mining R&D budget was prepared on the assumption that a consolidation of mining activities now conducted separately by DOE and Interior would be implemented during FY 1982.

— How was this consolidation to take place?
— What would be required to move the program to the Bureau of Mines?
— What are the advantages of this consolidation?
— What staff, physical resources, unobligated balances and uncosted obligations would be available to transfer from DOE to the Bureau of Mines?

Answer: The consolidation of mining activities from the Department of Energy into the Department of Interior is documented in Fossil Energy's FY 1983 budget submission and detailed in the President's DOE reorganization decisions. The transfer would be accomplished by the anticipated legislation merging DOE with the Department of Commerce, or possibly other legislation, which would instead return to Interior's Bureau of Mines.

There are two primary advantages associated with the consolidation of mining activities into one department. First, the Administration's position is that mining research and development activities fit logically with the Bureau of Mines other resource production programs. Mining technologies relate to resource extraction and related health, safety and environmental concerns in the production of coal — activities in which the Bureau of Mines is involved. Second, there will be a reduction in Federal overhead costs in this area by merging the two similar efforts.

At the time of transfer all staff, physical resources, unobligated balances and uncosted obligations — all resources of the DOE mining research program except those related to coal preparation — will be made available to transfer to the Bureau of Mines. The $1,000,000 requested in FY 1983 for the mining activity provides for only a limited in-house research program with the unobligated and uncosted funds supporting any necessary transitional activities.

Question: At some mines, longwall machines capacity to mine coal puts a severe strain on the haulage systems designed to remove coal from the mine face.

— To what extent does your mining R&D program address this problem?

Answer: Primary among past efforts in transport and supporting activities is the use of hydraulic transport to move large volumes of coal from the face to the surface. The hydraulic transport at the Mining Engineering Test Facility (METF) in Bruceton, Pennsylvania contains an extensive capability for testing all stages of slurry transport to develop data necessary to design systems compatible with mine operations, including the longwall method. Systems efforts are aimed at transporting large volumes of coal on a continuous haulage type basis.

## Surface Coal Gasification

Question: What is the current status of the Bi-Gas Pilot Plant facility at Homer City, Pennsylvania?

— What alternative uses of the Bi-Gas facility were identified in the study that was completed last summer? Provide a copy of the study for the Committee files.

— Is it not correct that this is a fully integrated plant which has many possible uses?

— What are the disadvantages to continuing the use of the plant?

— Has private industry made any proposals to the Department about the possible uses of the Bi-Gas facility?

Answer: The pilot plant has recently completed its fifth test on Pittsburgh Seam No. 8 bituminous coal. Testing of this bituminous coal started in February 1982. Prior to that time, all operations were carried out with Montana Rosebud subbituminous non-caking coal. Results of tests using this coal demonstrated the viability of the Bi-Gas process and a substantial data base was accumulated. With respect to the present coal

(Pittsburgh Seam No 8 bituminous coal) that is being used as a feedstock, operation will continue through July 1982. At that time, the funds remaining will be used to phaseout operations at this facility and to have the plant in a protected mothballed condition by the end of FY 1982.

The UOP/SDC study report dated September 1981, recommended the following uses for the Bi-Gas facility:

- Operation of the plant be continued, both to collect data and to prove the Bi-Gas process, as long as the schedule of the technical program is met
- Begin at once to prepare a detailed design for modifying the Bi-Gas plant to a high pressure, entrained flow syngas test facility; and
- Implement the modification plan as soon as the BIGAS process is proven or it becomes apparent that progress is unsatisfactory.

The Bi-Gas Pilot Plant is indeed a fully integrated facility for the conversion of coal into a substitute natural gas. It was constructed as a high pressure system to study and develop the Bi-Gas two stage entrained, slagging gasification process. The pilot plant itself is a comparatively large facility with a capacity of 120 tons per day of coal feed. As such it requires $1.0 to $1.25 million a month to operate.

Since it is a complete facility with dedicated utilities and rail access, the argument can and has been made that it does have the potential to be used for other uses once the current test program is completed. Any real consideration of this potential will depend specifically on a suitable match between the objectives of that program and the performance capabilities of equipment in place at the site. Any proposed program must be able to utilize the existing equipment with little modification. The need to make substantial modificaitons in addition to the known operating costs would make any use of the facility very expensive. In general, it is believed that similar experimental data could be acquired in facilities of much smaller capacity and lower operating costs.

With regard to the disadvantages to continued use of this facility, the Bi-Gas Pilot Plant was designed and constructed specifically to develop the Bi-Gas concept for the conversion of coal to a substitute natural gas. Specific requirements were used in the selection and installation of the equipment needed to accomplish that goal. A test program was developed and subsequently performed to explore key parameters and acquire specific data necessary for the continued development and evaluation of that process. The essential objectives of that program have been achieved. Subsequent cost/benefit considerations indicate that it is too expensive to continue operation of the plant to get additional, but non-essential data. It is believed that these data can be acquired in test programs performed on a smaller scale at considerably less cost.

Although a number of informal discussions have been held with individuals as well as representatives of industrial firms about possible future uses of the facility, no formal proposal has been submitted to the Department. The most recent and perhaps most definitive discussion was held with representatives of KBW Gasification Systems, Inc., a joint venture of Koppers Company and the Babcock and Wilcox Operating Unit of McDermott, Inc. This firm has been looking at the Bi-Gas test facility, on behalf of Tennessee Synfuels Associates, as a site for the construction and operation of a pilot plant/demonstration size KBW gasifier having a capacity of 8 tons/hour. The recent selections made by the SFC of projects to be considered for further evaluation did not include the Tennessee Synfuels Associates effort. It is not known what impact that this recent development will have on any interest of KBW in the Bi-Gas pilot plant site. In addition, it has been reported that the Indiana County Chamber of Commerce might be interested in buying the Bi-Gas facility from the Government provided they can find an industrial concern that would be interested in leasing it from them.

Question: Provide for the record a summary of the accomplishments from operation of the Hygas Peat Pilot Plant.

Answer:

Overview

The overall objective of the PEATGAS pilot plant program was to develop a gasification data base adequate to support the design and scale-up of commercial size plants for the production of substitute natural gas (SNG) from peat. The entire test program, consisting of a series of five individual test runs was conducted in the modified HYGAS pilot plant using Minnesota peat. The initial three tests employed the toluene slurry feed system used in the HYGAS coal gasification program. The remaining two tests used a dry lockhopper feed system designed specifically for peat feed. The testing phase of the program was terminated on March 31, 1982 after completion of the fifth test run.

Project History

The decision to modify the HYGAS pilot plant for use in a peat gasification program ws made in early FY 1980 when:

- Experimental work on the Process Development Unit (PDU) was completed.
- HYGAS coal gasification pilot plant program was nearing conclusion.
- It was determined to be more cost effective to do pilot plant scale testing in an existing facility.

The following modifications were made to the existing HYGAS pilot plant by November 15, 1981:

- Internal reactor modifications

- Modification of grinding equipment
- Installation of additional drying equiment
- Installation of dry lockhopper feed system

The test program was conducted in two phases:

- Phase I used a toluene slurry feed system, included test runs 1-3 and was conducted during June - August 1981.
- Phase II used the newly installed dry lockhopper feed system, included test runs 4 and 5 and was conducted during December 1981 - March 1982.

The testing phase of the PEATGAS program terminated March 31, 1982. The final report is anticipatd by November 30, 1982.

Program Results

The gasification data base developed from the five test runs indicated that peats with moisture contents varying from 5 to 30% could be successfully gasified using IGT's PEATGAS process. The data demonstrated the successful use and advantages of using a dry lockhopper feed system for peat. Gasification operating data was compiled at or for the following conditions:

Peat Moisture Content : 5 - 30% by wt

Feedrate : 200 - 400 lb/hr

Steam/Carbon Ratio : 1.1 - 2.0

Peat Conversion : 85 to 95%

Operating Pressure : 300 - 500 psig

Char Gasification Temp. : 1100 to 1700 F

HydroGasification Temp : 800 to 1100 F

The final program report is anticipated by November 30, 1982.

Question: Since the budget request assumes termination of several pilot plants, you have not requested any funds for engineering analysis and support.

— Assuming that several pilot plants were kept open, what engineering analysis and support would be required?

Answer: Engineering analysis and technical support for pilot plant programs has been provided in the past via multi-year support contracts. There are currently in place or planned for establishment in FY 1982, contracts which will provide access to any technical support and analysis that might be required during FY 1983.

Question: What are the final results from operation of the gasification pilot plant at Windsor, Connecticut by Combustion Engineering?

— How many coals were tested and how much did the facility cost?

Answer: Twelve test runs were conducted at the facility. These tests did successfully demonstrate the capability of an atmospheric, entrained-bed air-blown and oxygen enriched air-blown integrated system to produce low Btu gas from coal. Application of the product gas as a boiler fuel to generate steam was also demonstrated. However, a steady state operation of the gasifier and its integrated system (i.e., coal pulverizer and feed, gas coolers and cleaners, char recycle, sulfur removal and steam generation) at design conditions of 5 tons coal/hour to produce a low Btu gas of predictable composition and heating value of 112 Btu/SCF was not achieved. (Heating values of the product gas ranged between 30-80 Btu/SCF.)

Except for the gasifier, use of off-the-self equipment as component parts was demonstrated. However, due to progressive deterioriation of the mechanical equipment, the PDU is no longer capable of producing useful data.

Only one coal, Pittsburgh Seam, was used in the test program.

Facility cost was approximately $11 million (hardware), these costs were shared with Combustion Engineering (C.E.) on a 2/3 DOE, 1/3 cost basis.

Question: What is your assessment of the comparative readiness of Gasification and liquefaction processes for commercialization?

Answer: It is generally considered that commercial state-of-the-art coal gasification processes exist while direct liquefaction processes are not at or approaching the demonstration plant stage. Of course the availability of a commercial gasification process and an existing synthetic gas conversion process (i.e., the Fischer-Tropsch process) creates the capability to convert coal into liquid fuel products through the process of indirect liquefaction. It must be noted however, that while the gasification process had reached an initial stage of commercial readiness using state-of-the-art gasifiers such Lurgi, Winkler and Koppers-Totzek gasifier systems, the current economic, environmental and technical limitations of these existing technologies makes them unattractive as processes for industry to commercialize in the United States. Therefore, DOE has been sponsoring research and development efforts which are aimed at reducing the capital cost and increasing processing flexibility (the capability fo utilize all coals as feedstocks) of the process through process innovations, component improvements and prudent materials selection, and by optimizing process designs which will increase operational efficiencies and reduce or eliminate environmental emissions. These studies are more fundamentally aimed at long range, high risk research which can have significant effects on the future commercial status of coal gasification process.

As noted, indirect liquefaction processes have also achieved an initial stage of commercial readiness based on state-of-the art production of fuel gas from the Lurgi, Winkler or Koppers-Totzek gasifiers followed by commercial processes for gas cleanup and the production of methanol or other liquid products such as ammonia, Fischer-Tropsch liquids, etc. The economic, technical and environmental restrictions which apply to gasification apply to indirect liquefaction as well. So improvements and advances made in gasification technology impact directly on the future potential of indirect liquefaction processes.

Question: Since the equipment/instrumentation concepts subactivity is not process specific activity, why are you reducing it from $10,344,000 to $3,000,000?

Answer: This reduction is consistent with the redirection of the Fossil Energy program away from larger development oriented efforts and towards longer range, high risk research studies on concepts that have the potential to make significant improvements in the operational realiability and control of advanced coal gasification processes. In addition, this reduction also reflects either the completion of or the phasing out of a number of major component development projects during the FY 1982 period. These large projects coming to an end include the development of a high pressure, high capacity oxygen compressor, coal slurry pump, and some feeders.

## Enhanced Oil Recovery

Question: What is the current estimated amount of enhanced oil recovery in the United States in barrels per day? What is the potential?

— How does this compare to what it was in 1973 before the large increase in oil prices?

Answer: The current estimated amount of enhanced oil recovery in the United States is approximately 375,000 barrels per day. With current technology the potential is 700,000 in 1990 and 1,100,000 in 2000. With advanced technology it is 1,400,000 in 1990 and 2,700,000 in 2000. The advanced technology case assumes a deliberate R&D effort by both the industry and Government.

In 1973 it was 260,000 barrels per day.

Question: Provide for the record the costs of the downhole steam generator test.

Answer: Department of Energy has spent a total of $16.9 million in the development and testing of the downhole steam generator. This project will be completed in FY 1982.

Question: What tar sands recovery processes offer the most potential?

Answer: Up to 90% of the U.S. tar sand resource is buried too deeply for surface mining and processing; therefore, the ultimate process(es) will have to rely on an in situ recovery technique. The only practical way to recover the extremely viscous, solid-like bitumen from tar sand deposits is through heating; even a small amount of heat reduces viscosity of bitumen sharply and facilitates its flow through the reservoir. Steam injection and in situ combustion (also known as fire-flooding), or a combination of these methods with adaptations offer the best potential at this time. Of all the traditional petroleum resources in the United States (light oil, heavy oil and tar sand), the tar sand resource is the most difficult to develop.

Other potential in situ recovery methods include radio frequency (RF) heating and a combination of mining and in situ, i.e., drilling of horizontal wells from within a shaft penetrating the tar sand deposit.

The remaining 10% of the resource can be surface mined and processed at the surface in much the same way as is done in Athabasca tar sand deposit in Canada.

## Oil Shale

Question: In your opinion, what technology developments would be most beneficial in helping to reduce the cost of recovering oil shale so that oil shale would be more competitive?

Answer: The major areas of technology improvement needed to make oil shale more economic and competitive are better understanding of the chemistry and physics of shale processing and materials handling required to design more efficient extraction systems. Optimized systems will incorporate control of environmental emissions within the basic operational design to reduce the costs of downstream cleanup hardware and pollution-control systems. Research related to in situ processing should continue to receive strong emphasis because such systems offer the greatest long-term potential for reducing the high costs associated with extraction and materials handling, but even here, all aspects of the system from access to the ore through bed preparation and processing to product recovery and environmental control represent areas where the present technology base is inadequate.

Question: Provide for the record where the work in the oil shale technology base will be done.

Answer: We plan to have a large part of the oil shale research in chemistry, physics, and the environment performed at a multipurpose facility located in Laramie, Wyoming. Some of the fragmentation-related research would also be performed at this facility although the majority of such research is expected to be conducted by the Sandia and Los Alamos National Laboratories located in New Mexico. The Los Alamos laboratory, as well as the Lawrence Berkeley National Laboratory in California, will also participate in the planned environmental program; and some components of the chemistry and physics program are expected to be performed by the Lawrence Livermore National Laboratory, also in California.

Question: Provide for the record all the other government activity in oil shale environmental mitigation and how it relates to the work you are doing.

Answer: The Office of Health and Environmental Research within the Department of Energy has a program that strives to quantify oil shale environmental hazards. OHER defines the problem, identifies the contributing factors and assesses the magnitude and severity of oil shale's impact on the environment. This basic understanding of environmental impacts of oil shale enables Fossil Energy to focus its R&D efforts on technology for environmental mitigation.

The program consists of the following activities:

1. Pollutant characterization of waste streams from oil shale retorting and processing.
2. Rates and pathways of oil shale pollutants in air, water, solid wastes and food chains.
3. Evaluation of biological and chemical activity of pollutants identified in oil shale waste streams.
4. Determination of the risks to man from exposure to oil shale pollutants. FY 1982 funding for this work is $5.7 million and in FY 1983, it is projected to be $5.0 million.

The Environmental Protection Agency (EPA), is working with the Office of Fossil Energy by participating in the 150 ton retort test at the Department's Laramie Energy Technology Center. EPA is supplying a Venturi Scrubber in the environmental control experiments that will aid in assessing the chemistry, physics and fate of pollutants in oil shale waste streams. This research will provide an environmental data base that will help minimize the environmental impacts of oil shale technologies.

In addition, this summer EPA will test a Stretford Unit of hydrogen sulfide removal on Occidental's Retorts 7 and 8 on the Cathedral Bluffs $C_b$ lease tract.

The U.S. Geological Survey is involved in baseline hydrology studies and geochemical characterization in the Piceance Basin. The data generated from these efforts will assist the Office of Fossil Energy in its research program. The FY 1982 budget for this effort if $1.3 million and for FY 1983 it is also $1.3 million. Fossil Energy coordinates with U.S.G.S. in these efforts by reviewing respective programs relevant to oil shale environmental mitigation.

The Bureau of Land Management has the following proposed Environmental Impact Statements for oil shale:

1. Supplemental Prototype Lease EIS which will be available in final form on November 19, 1982.

2. Programmatic EIS for the proposed large scale leasing program on Bureau lands. This is due on December 10, 1982. Rules and regulations will also be promulgated for this oil shale leasing program.

3. EIS for land use plan which will be done for Colorado, Utah and Wyoming.

4. EIS for Chevron. Chevron's proposed site is on non-Federal land but an EIS is required because the pipeline crosses public lands. The EIS will address the right-of-way application.

5. EIS on Uintah Basin Synfuels. This is an EIS on all rights of way for leases in Utah and includes oil shale and tar sands.

It must be emphasized tht this work on EIS's, although included as work in environmental mitigation, may never materialize since many EIS's do not get approved or are not implemented.

The Fossil Energy Office utilizes the input from these EIS's to enhance its technology data base and assist in conducting research relevant to the environmental impacts of oil shale technologies.

The Department of Interior's Conservation Division, located in Grand Junction, Colorado, has a requirement to ensure that environmental mitigation in oil shale is carried out in the DOI prototype lease program.

The Office of Fossil Energy regularly coordinates with the Conservation Division and with all segments of DOI. An oil shale staff member is the Department's representative on DOI's Oil Shale Environmental Panel.

The Corps of Engineers is preparing an EIS for the scale-up 20,000 barrel per day commercial retort at Union Oil. The company plans to construct a dam on Parachute Creek for its water supply. The draft EIS is to be completed by December 1982 and the final EIS will be issued in May 1983.

## Enhanced Gas Recovery

Question: Please describe the status of the unconventional gas multiwell project.

— What information would be lost if the third well were not completed?

Answer: The multi-well project is located on a Superior Oil Company lease near Rifle, Colorado. The first well of the scheduled three-well project was started September 13, 1981, and completed on December 12, 1981 at a total depth of 8350 feet. The second well was started on January 1, 1982, and completed on March 25, 1982 at a total depth of 8300 feet. Currently, plans for a fracture stimulation are being finalized. Stress-testing of the second well should begin some time in June. The decision to drill the third well is being indefinitely delayed since the Administration's policy is that industry will evolve the necessary technology to produce the blanket sands. A small amount of carryover and deferred funds are available to complete a stimulation test and wrap up ongoing research in FY 1983. Industry has expressed some interest in taking over the project; but to date no offer has been made.

A three-well multiwell project provides the opportunity to test two different fracture parameters in as similar a lenticular reservoir as possible through the use of "paired well tests"; that is, two fractures at the same interval in neighboring wells. Parameters such as propant type and size, fracturing fluids, fracturing pressures and injection rates could be varied and compared through the results of production tests. One well has been designed a stress well to obtain information on this parameter and cannot be used for stimulation. Thus, paired well tests are possible with only three wells.

Borehole seismic and hydrophone techniques will be used to determine fracture geometry during stimulation. Improved diagnostics can be obtained by using offset, rather than the fracturing wells. The use of the three wells will allow triangulation for better definition and allow the use of several units and techniques for redundancy and improved resolution. Accurate fracture geometries are imperative for stimulation analyses and the attainment of most of the stimulation goals. In addition, much less data on lens trend and continuity will be gathered with two wells versus three wells.

Well-to-well interference tests can provide a unique measure of the in situ permeability and porosity. Two interference tests at right angles to one another are possible with three wells and can determine, in situ, the permeability within a lens.

Question: Please explain the significance of the "mineback facility" in eastern shales.

Answer: The proposed Eastern Gas Shale mineback facility would serve as a testbed for improved production technology for this resource. Production of eastern gas shales currently is confined to localized geologic areas where natural fracturing of the shale is abundant. Since there is small probability of a well intercepting suitable natural fracture system conditions, there is substantial economic risk to producing from the shales unless fractures can be induced with predictable results via stimulation. The necessary stimulation technology developed to date has largely been by trial and error. Also, little is known about the storage and production mechanisms for gas in the shale.

The proposed Eastern mineback facility provides, using a defined reservoir, the opportunity for direct in situ observations and measurements of these reservoir characteristics and of the effects of various methods to fracture the shale. Improved well stimulation methods will result from these observations and measurements. Improvement in predictive models will occur as a result of the increased knowledge of shale storage and producing characteristics. The Gas Research Institute (GRI) has shown interest in the mineback project, and DOE is turning over to GRI the results of a characterization of a possible site.

Question: Although there is no request for enhanced gas recovey, there will be an estimated $10,000,000 in outlays.

— What staff will be available to oversee these experiments?

Answer: The lead center for unconventional gas research is the Morgantown Energy Technology Center. Currently, a staff of approximately 12 full-time professional people is engaged in unconventional gas research. The staff has wide technical and management experience in many phases of petroleum and natural gas research, including such areas as tight sands, Devonian shales, coalbed methane and methane hydrate. This staff, plus remaining personnel at the Headquarters will provide the core for oversight of any continuing activity.

### Program Direction

Question: Provide for the record an object class breakout of the program direction activity for both FY 1982 and FY 1983.

Answer: The object class breakout of the FY 1982 and FY 1983 budget authority for Fossil Energy program direction is shown in the following table.

| | (Dollars in Thousands)<br>FY 1982 | FY 1983 |
|---|---|---|
| Salaries | $11,590 | $7,440 |
| Benefits | 1,356 | 870 |
| Travel | 1,070 | 690 |
| | 14,016 | 9,000 |

Question: Please provide for the record for total fossil energy programs the amounts of dollars allocated to energy technology centers, universities, national laboratories, and industrial organizations in both Fiscal Year 1982 and Fiscal Year 1983.

Answer: Fossil Energy funds are in FY 1982 and FY 1983 allocated by performer as shown in the following table:

| | ($ In Millions) | |
|---|---|---|
| | FY 1982 | FY 1983 |
| ETC's | $ 62.1 | $ 31.90 |
| National Labs | 50.2 | 10.10 |
| Universities | 21.3 | 6.39 |
| Other Federal | 14.1 | 5.03 |
| Industry | 244.0 | 40.32 |
| Other [a/] | 15.3 | 10.36 |
| TOTAL[b/] | 407.0 | 104.10 |

a/ Includes non-profit organizations, state and local governments, and Headquarters program direction.

b/ Does not include construction.

Question: Provide for the record the basis for the $1.5 million request for payments to former personnel.

Answer: The $1.5 million request for payments to former personnel was based on the separation of approximately 90 Fossil Energy employees, assuming those personnel would not find another Federal position. An additional assumption is severance payments of about $16,500 per employee based on the more senior nature of the average Fossil Energy employees following the FY 1981 reduction in force. All the separated employees were assumed to be located at the Energy Technology Centers; therefore no funds are requested in the Headquarters Program Direction line item for severance payments. It should also be noted that the approximately 90 employees requiring severance payments assumed a significant attrition rate to meet the FY 1982 staffing requirements.

## QUESTIONS SUBMITTED BY CONGRESSMAN JOHN MURTHA

### Personnel Reductions

Question: What are your estimates and assumptions as to the costs of separating 145 Fossil Energy employees in the 4th Quarter, FY 1982? Included in this estimate should be 1) severence pay; 2) lump sum annual leave; and 3) unemployment benefits and retirement benefits.

Answer: My assumptions are as follows:

- o Approximately 145 people will have to be separated by late summer 1982.
- o The average salary for a Fossil Energy employee is $43,050 per annum.
- o For lump sum annual leave payments, 240 hours of leave will have been accumulated.
- o For severence pay, the average employee will be 40 years old and have 15 years of government service which equates to 20 weeks of severence pay.
- o For unemployment compensation, a 13-week extension to the basic 26 weeks of unemployment compensation will apply.

Based on these assumptions, the cost of separating 145 employees is:

| | |
|---|---|
| Lump Sum Annual Leave | $ 725,000 |
| Severence Pay | 2,400,000 |
| Unemployment Compensation | 900,000 |
| Total Costs | $ 4,025,000 |

Question: We understand that DOE's actual manpower is projected to be under its FY 1982 FTE ceiling by a substantial amount. Did you appeal to the Assistant Secretary for Management and Administration for a relocation of FTE's in order to avoid RIF within Fossil Energy of 145 personnel in FY 1982? If not, why not?

Answer: I did appeal to the Assistant Secretary for Management and Administration for reallocation of FTE's. Later, Fossil Energy took action to meet its program requirements through a reorganization which resulted in lower staffing requirements.

Question: In the RIF procedures in effect for the Federal Government it is almost impossible to choose the best, most capable personnel to manage a complex program such as Fossil Energy R&D. This can be seen by the severe dislocations caused in the Conservation and Solar areas by that RIF. How can you assure the quality and skill mix of personnel given a reduction of this magnitude? Are you taking the view that people are interchangeable in any organization? It seems no consideration has been given to the mix of skills, talents, experience or abilities.

Answer: As I previously stated, RIF procedures allow us to define and set the specific job skills that will be required to carry out our mission within the frame work of the new organization. There is conscious management decision in describing the specific job skills required for each position. Employees are assigned only to those positions for which they are fully qualified and competition for placement is against other employees similarly qualified for such positions. As you know, we must then rely on the formal reduction-in-force (RIF) procedures to determine the specific individuals who will be placed in positions in our new organization.

The existing Fossil Energy employees will have the sole right to compete for those 100 positions identified in the proposed organization, as the defined "competitive area" for this action will be Fossil Energy headquarters. This competition during a RIF will be in full compliance with Office of Personnel Management regulations which require full consideration of employee technical qualifications, time in service, job performance, as well as veterans preference. Employees' rights will be fully protected during this process.

As point of reference, it should be noted that during the last RIF in Fossil Energy we initially had to separate 126 employees, but by the effective date this was reduced to 46 people. This was the result of heavy attrition and extensive management effort during the RIF process to reassign and bring back employees to vacancies created during this time. The net result was that many good and talented employees were placed back in positions where they have been making major contributions to the management of Fossil Energy programs. I am hoping that a similar situation will occur during this upcoming reduction.

The number of people affected by the reduction is of great concern to us, and to this end, we have been looking at various ways that we can provide assistance to the people affected by this reduction. Some of the things that we have arranged to do are as follows:

1. We have established two working groups to coordinate all outplacement assistance. Working groups will be comprised of Fossil Energy personnel and Office of Personnel representatives and will work directly with designated support contractors, other government departments, and private sector employers.

   o One working group will be responsible for coordinating the counseling and outplacement of clerical/support staff.

   o Another working group will be responsible for coordinating the counseling and outplacement of professional staff.

   o The chairman of each working group will be designated as the point-of-contact for placement of employees with other DOE elements, other government departments, and private sector employers. The Office of Personnel will designate these individuals as their representatives with other government departments.

2. We will develop a book of employee skill profiles categorized by type of qualifications. Initially, these profiles will be formally sent to all government agencies and over 250 private organizations. Thereafter, they will be used as a reference in open discussions with these agencies and organizations.

3. Working groups will monitor to ensure that employees placed on the DOE Priority Placement List are given full consideration for all DOE vacancies for which they are qualified. This list is supposed to effectively freeze hiring in all vacancies until affected employees are placed.

4. The Office of Personnel will explore the possibility of paying for employee retraining costs, as is presently done by the Department of Defense.

5. We will discuss with the Office of Personnel Management (OPM) the possibility of having affected employees placed on Priority Placement registers of other government departments. Hopefully, with OPM support, these other departments would be required to place our employees first in existing vacancies for which they qualify or be required to justify in writing why this was not done.

6. I have sent a request to the Office of Personnel requesting that they solicit from OPM Voluntary Early Out Retirement Authorization for Fossil Energy employees.

Question: Your own internal manpower analysis indicates an FTE deficit in Fossil Energy in the 50-60 range based on actual usage for the first six months of FY 1982 and projected on-board levels for the remainder of the year. The announced RIF of headquarters personnel from the current 245 full-time positions to 100 full-time positions in the late summer has as its supposed purpose the elimination of this 50-60 deficit. In fact, however, an analysis shows that a RIF effective on August 1, 1982, to the 100 level will effect FTE savings of only about 25 FTE's or one-half the projected deficit of the entire year. How is the remaining deficit of 25 FTE's to be absolved considering no RIF is to be conducted at the ETC's? Is there a trade-off planned within DOE?

Answer: The planned headquarters staffing reductions related to the reorganization should result in savings of about 35 full-time permanent full-time equivalents. The balance of the indicated FTE deficit is expected to be made up through redirection of existing DOE resources.

Question: Describe the changed functions and responsibilities within Fossil Energy and associate with it the staffing and funding level for each program within the office. Also provide with this organizational listing a descriptive listing of activities that the program office is responsible for. This should be done for the following cases: 1) FY 1983 funding of $107M and 100 FTE; 2) FY 1983 funding of $305M and 100 FTE; and 3) FY 1983 funding of $417M (FY 1982 level) and 100 FTE.

Answer: The organization represents a sound program alignment and workload balance for the Fossil Energy program. In this regard, it enhances the synergistic effect of bringing the functions of all liquid supply technologies into one organization, the Office of Oil, Gas, Shale and Coal Liquids. It further recognizes the important relationship of several coal utilization research and gasification efforts by establishing an Office of Coal Utilization, Advanced Conversion and Gasification. We have also continued the philosophy of centralizing existing management functions by consolidating the Technical Coordination Staff and Communications Staff with all planning, budget, administrative and management functions in one organization which will maximize efficient use of staff and program support personnel. In the case of strategic planning, we will dedicate selected staff to line offices to carry out day-to-day activities while preserving overall management direction to the centralized Division of Planning and Environment. It should be noted that the Interior and Related Agencies Appropriation Act for FY 1982 transferred the leasing policy functions to the Department of the Interior (DOI). Effective May 16, 1982, the leasing program activities and associated resources transferred to DOI.

As I have previously stated, headquarters policy and program direction functions and staffing levels will be relatively insensitive to the funding levels because of decentralization of program execution activities to the field. We have examined the organization at the FY 1982 $417 million program level and have defined the functions which would be performed at that level (see attached). You also asked which functions would be performed at the $107 million and $305 million levels. In this regard, essentially the same functions will be performed in headquarters regardless of the funding level; however, the volume or level of staffing required outside headquarters to carry out projects in the field will vary with funding levels. Therefore, these same headquarters functional statements apply to all three cases. Also attached is the Fossil Energy organization chart to which these functions pertain.

Question: We understand that, to some extent, you are basing your decision regarding a reduced headquarters staffing level on improved management efficiencies. Provide us with all examples (i.e., memoranda, field instruction, changed reporting requirements, etc.) as to the improved efficiency of operation and management of Fossil Energy. Provide us with any management analysis that you have performed that measures this improved efficiency.

Answer: When I came on-board in August of last year, the 1983 budget process was well underway in Fossil Energy. Our first internal budget submission came only a month after I became Assistant Secretary. While at this time I had begun to look at the management structure and assignment of responsibilities within Fossil Energy, as well as the comparisons with other DOE and government energy programs, these analyses were in very early stages. Consequently, I decided to approve the levels you had mentioned.

Once the budget formulation process had been completed after Christmas, I was able to concentrate more of my attention on our management structure and begin to draw my own conclusions. I am now convinced, and it is my management judgment and belief, that the 100 level for headquarters personnel is adequate to carry out my concept of the role of a headquarters organization.

As you know from past discussions on this subject, we have been moving to decentralize the execution of our programs to the field. The role of headquarters, in general terms, is to develop the programs and goals. The headquarters role is not to execute the programs, thus relatively few people are required in headquarters. Our program is executed at the Energy Technology Centers and in a few cases by the National Laboratories. As FY 1982 progressed, I continued to review both my headquarters and field organizations. This review was started in late FY 1981. I compared and evaluated the role of headquarters versus the role of the field and the size of headquarters groups in other organizations. I concluded that we could adequately perform the headquarters function for the 1982 budget with 100 people. For comparison purposes, in my role as Vice President-General Manager of a chemical division with $450 million in funds, the comparable headquarters activity for the full range of activities of that division was about 30 people. The German Ministry of Science and Technology funds and manages a broad variety of energy research activities. This specific work which is conducted in industry, universities and national institutes, has a headquarters staff of about 100 for an $800 million program and field management staff of another 100. Finally, the Office of Energy Research within the Department of Energy has a headquarters staff of about 200 people for a large budget of about $1.2 billion. The Office of Energy Research uses operations offices and national laboratories for their field execution.

Question: Management and administration of a $100 million program must be significantly different than that of a $400 million program. However, according to your Congressional testimony in regard to the Energy Technology Centers staffing, there is a critical mass capability that must be maintained to effectively operate a R&D program. Doesn't this apply also to the headquarters program management, policy and planning functions? Why do you believe staffing levels have no programmatic dollar basis? Please provide us with your detailed analysis that led to your decision that a staffing level of 100 FTE at Fossil Energy headquarters was sufficient to carry out your responsibilities?

Answer: There are two primary reasons why I believe a viable Fossil Energy research program can be conducted with a complement of 100 headquarters personnel:

1) In the past, a large headquarters staff was required because many Fossil Energy projects were managed directly out of Washington. I am convinced that a more effective and efficient way to run a research program is to decentralize day-to-day project implementation to our field structure. This allows the headquarters staff to devote their full attention to policy, program and budget development, and overall guidance and coordination. By clearly delineating the roles of headquarters and the field, and by decentralizing as much project management responsibility as possible to the field, I am convinced significant reductions in headquarters personnel are possible regardless of the funding level of the program.

2) There are several direct comparisons that can be made that reinforce my judgement that a large headquarters complement is not necessary:

— Other DOE program offices manage programs with signficantly less headquarters personnel in proportion to dollar levels than does Fossil Energy.

The Energy Research office manages more than $6 million for every one headquarters employee.

The R&D component of the Nuclear program manages more than $4 million for every headquarters staff member.

In FY 1982, Fossil Energy is managing a $417 million program with 250 headquarters employees — that is only $1.6 million per person.

— My experience in industry also shows that effective management is possible with a relatively small headquarters staff. At Union Carbide, for example, we carried out a program of about $450 million, which encompassed the full range of disciplines — from research to marketing — with a headquarters staff of about 30 people.

— Comparisons can also be drawn with the Federal Republic of Germany's Ministry of Science and Technology, which is responsible for conducting energy research in many of the same areas in which we are working. Likewise, they operate within a similar democratic framework, in that they too are responsible to a legislative body. They conduct a viable program with proportionately less personnel than we have in Fossil Energy.

Question: In your November 1981 appeal of the FY 1983 OMB allowance for the Program Direction activity you stated that management efficiencies could effect savings of 100 FTE's from the 289 FTE level and, therefore, requested 100 FTE's at headquarters associated with the $305 million budget request. Please provide the analysis which supported this 190 FTE level. Why is this analysis still not valid with a FY 1982 program of $417 million and a comparable FY 1983 program being considered by the Congress?

Answer: As I previously stated, when I came on-board in August of last year, the 1983 budget process was well underway in Fossil Energy. Our first internal budget submission came only a month after I became Assistant Secretary. While at this time I had begun to look at the management structure and responsibilities within Fossil Energy, as well as the comparisons with other DOE and government energy programs, these analyses were very informal and in very early stages. Consequently, I decided to approve the levels you had mentioned.

Once the budget formulation process had been completed after Christmas, I was able to concentrate more of my attention on our management structure and begin to draw some conclusions of my own. I am convinced that 100 personnel for headquarters is adequate for the FY 1982 program of $417 million.

Question: How many support service contractor personnel supplement the ASFE work force in headquarters?

Answer: Fossil Energy utilizes approximately 179 contractor man-years of effort. They provide assistance and support to our program managers and the performance of general administrative and technical work. The functions they are providing are contractor type support activities consistent with DOE Order 4200.3.

Question: What studies and analyses have been made with respect to eliminating the support service contract employees who, by statute, cannot be permitted to perform management functions or personal services which, by statute, can be performed by federal employees?

Answer: Fossil Energy constantly monitors, checks and reviews all new and existing support service contracts to be sure that contractor personnel perform only authorized activities permitted by statute. In addition, the Departmental Office of Procurement and Assistance Management and the Office of Organization and Management Systems conduct independent reviews on all new proposed support service contracts to further assure that we are complying with all appropriate federal and Department of Energy regulations applicable to support service contracts.

Question: Does any cost advantage accrue to the Government from using support service contract personnel in lieu of Government personnel?

Answer: Yes. Historically there has been considerable cost savings by the Government's use of a variety of support services contracts. These contracts provide us with flexibility to meet varying workload demands easily as well as the ability to meet unforeseen emergency requirements without the attendant diseconomies of maintaining a full-time permanent government staff. In addition, these contracts are often used to supplement the federal work force by providing short-term expert assistance that is not readily available from the in-house staff. Moreover, since these services are acquired from the competitive marketplace, they provide the Government with typically the best and least expensive sources.

Question: If a sufficiently high federal personnel ceiling is granted to ASFE, considering that federal workers can perform personnel services as well as management functions (which are illegal for support service contract personnel to do), would there be any reason not to terminate support service contracts and retain federal employees?

Answer: As I previously stated, we only use support service contracts to assist our program managers in activities that support their program and are consistent with DOE Order 4200.3 The level of support is determined by program needs and not the federal personnel ceiling. Therefore, retention of federal employees is not related to support service contracts.

## OFFICE OF COAL UTILIZATION, ADVANCED CONVERSION AND GASIFICATION

- Provides overall executive management control and planning guidance for the Fossil Energy Coal Utilization, Advanced Energy Conversion and Surface Coal Gasification Technology program, including the advancement of the science and engineering data base for coal utilization technology, gasification, processes, components and systems.
- Responsible for development, direction and evaluation of a research and development program directed toward development of a technology base for Magnetohydrodynamics electric power generation.
- Responsible for development, direction and evaluation of atmospheric fluidized-bed, pressurized fluidized-bed and other combustion systems in commercial and industrial applications.
- Responsible for development, direction and evaluation of Heat Engines, Heat Recovery and Fuel Cell research and development programs.
- Responsible for development, direction and evaluation of a Surface Coal Gasification and Advanced Coal Research programs.
- Responsible for development, direction and evaluation of the Advanced Environmental Control Technology, Coal Preparation and Advanced Research and Technology Development Coal Utilization programs.
- Responsible for development, direction and coordination of the Mining Research and Development Program.

## OFFICE OF OIL, GAS, SHALE AND COAL LIQUIDS

- Provides overall executive management control and planning guidance for the Fossil Energy oil, gas, shale and coal liquids programs and the Great Plains Gasification Plant loan guarantee.

- Manages oil, gas, drilling and offshore technology; product characterization and utilization; oil shale and underground coal conversion; research and development programs for extraction and utilizing energy from fossil fuel resources.

- Manages the development, direction, implementation and evaluation of comprehensive research and development program in coal liquefaction development adequate to support technology base development.

- Coordinates and cooperates with industry in the execution of the research and development program which promotes further development of the technology base in the private sector.

- Responsible for an exploratory program in innovative process concepts having potential for significant cost reduction or other improvement in synfuels production technology.

- Manages the advancement of the science and engineering data base for coal liquefaction, oil, gas and oil shale systems.

- Responsible for development, direction, implementation, termination and evaluation of feasibility studies, cooperative agreements, synthetic fuel loan guaratees, and major pilot plant and demonstration plant programs.

- Manages data exchange with the Synthetic Fuels Corporation (SFC) and plans and manages the mutual support activities defined in the Supplemental Agreement between the SFC and Fossil Energy.

## OFFICE OF MANAGEMENT, PLANNING AND TECHNICAL COORDINATION

- Overall responsibility for Resources Management.

- Responsible for planning and environmental activities.

- Principal interface with the Energy Technology Centers and DOE Field organizations.

- Manages all administrative activities of the Fossil Energy program.

- Responsible for Technical Coordination functions including line management of selected Advanced Research and Technology Development activities.

Communications Staff (Within the immediate office of the Director of Management, Planning and Technical Coordination)

- Responsible for all media, Congressional and industrial relations.

- Prepares all Congressional testimony and speeches relating to the Fossil Energy program.

- Operates the Fossil Energy mailroom.

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TUESDAY, MAY 18, 1982.

## OFFICE OF SURFACE MINING

### WITNESSES

**DANIEL N. MILLER, JR., ASSISTANT SECRETARY, ENERGY AND MINERALS**

**JAMES R. HARRIS, DIRECTOR**

**J. STEVEN GRILES, DEPUTY DIRECTOR**

**DEAN K. HUNT, ASSISTANT DIRECTOR, TECHNICAL SERVICES AND RESEARCH**

**WILLIAM B. SCHMIDT, ASSISTANT DIRECTOR, PROGRAM OPERATIONS AND INSPECTION**

**CARSON W. CULP, JR., ACTING ASSISTANT DIRECTOR, MANAGEMENT AND BUDGET**

**JOSEPH W. GORRELL, DIRECTOR OF BUDGET, DEPARTMENT OF THE INTERIOR**

### OPENING REMARKS

Mr. YATES. Mr. Reporter, show the hearing as coming to order. This is the hearing on the appropriation for fiscal year 1983 for the Office of Surface Mining, Reclamation and Enforcement, Department of Interior. Witnesses appearing in support of that appropriation are Mr. Miller, Mr. Harris, Mr. Griles, Mr. Hunt, Mr. Schmidt, Mr. Culp and Mr. Gorrell.

Mr. Harris' statement may be made a part of the record to be followed by his biography, and the biographies of Mr. Griles and Mr. Hunt, Mr. Schmidt and Mr. Culp.

[The information follows:]

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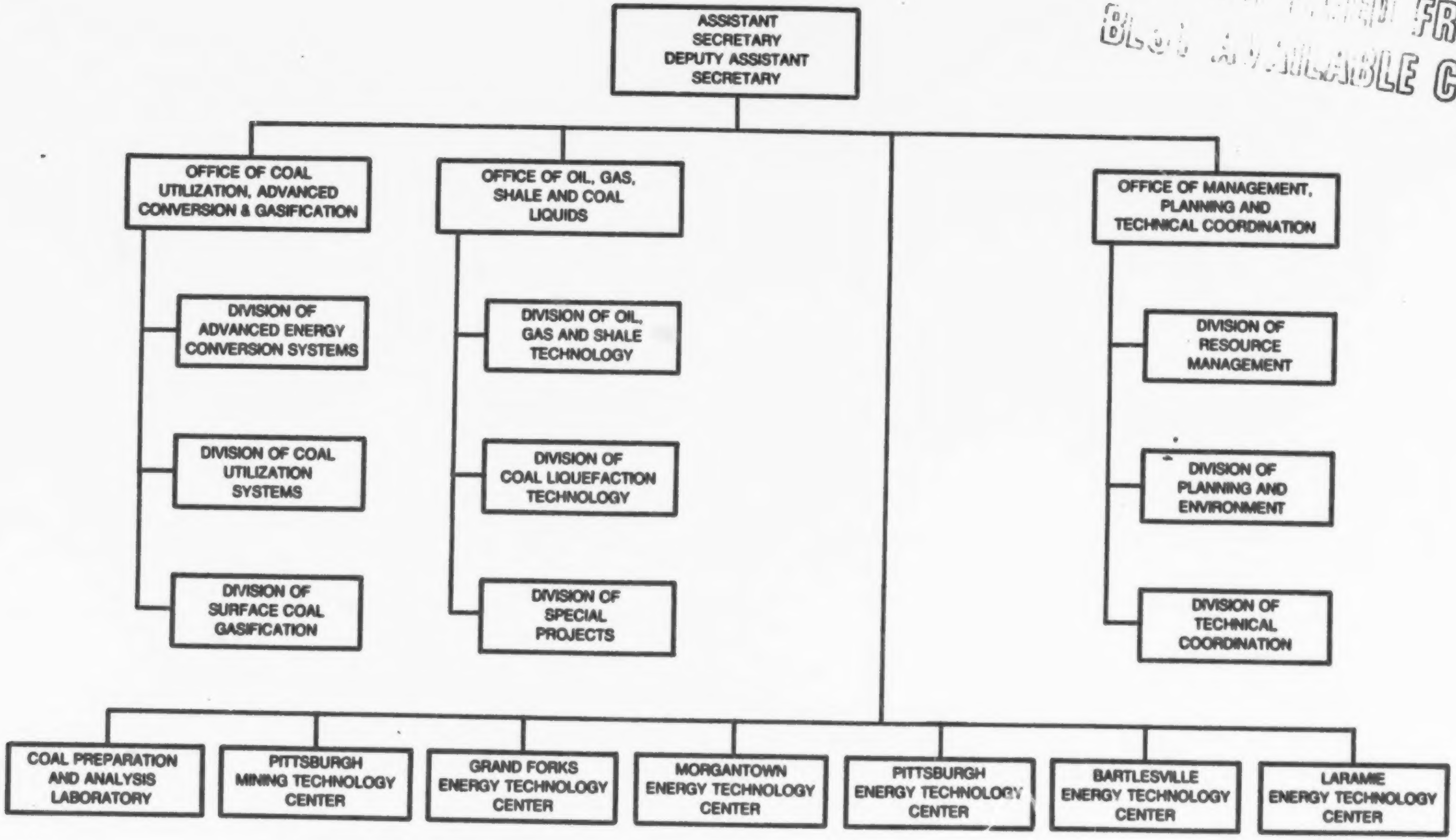
# OFFICE OF FOSSIL ENERGY


ASSISTANT SECRETARY
DEPUTY ASSISTANT SECRETARY
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OFFICE OF OIL, GAS, SHALE AND COAL LIQUIDS
OFFICE OF MANAGEMENT, PLANNING AND TECHNICAL COORDINATION
DIVISION OF ADVANCED ENERGY CONVERSION SYSTEMS
DIVISION OF COAL UTILIZATION SYSTEMS
DIVISION OF SURFACE COAL GASIFICATION
DIVISION OF OIL, GAS AND SHALE TECHNOLOGY
DIVISION OF COAL LIQUEFACTION TECHNOLOGY
DIVISION OF SPECIAL PROJECTS
DIVISION OF RESOURCE MANAGEMENT
DIVISION OF PLANNING AND ENVIRONMENT
DIVISION OF TECHNICAL COORDINATION
COAL PREPARATION AND ANALYSIS LABORATORY
PITTSBURGH MINING TECHNOLOGY CENTER
GRAND FORKS ENERGY TECHNOLOGY CENTER
MORGANTOWN ENERGY TECHNOLOGY CENTER
PITTSBURGH ENERGY TECHNOLOGY CENTER
BARTLESVILLE ENERGY TECHNOLOGY CENTER
LARAMIE ENERGY TECHNOLOGY CENTER

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### Statement of James R. Harris
### Director, Office of Surface Mining Reclamation and Enforcement

Before the House Subcommittee on
Appropriations for
The Department of the Interior and Related Agencies
May 18, 1982

Mr. Chairman and distinguished members of the Committee:

I am pleased to have this opportunity to highlight and to support the President's Fiscal Year 1983 budget request for the Office of Surface Mining (OSM).

The major program accomplishments and policy assumptions which were the basis for this budget request include significant regulatory reform, a major reorganization, and the achievement of primacy by the principal coal-producing States.

Concerning State regulatory programs, all but three currently producing States will have assumed primacy for regulating coal mining operations within their boundaries by the beginning of Fiscal Year 1983. It is anticipated that Alaska will assume this responsibility during Fiscal Year 1983 leaving Georgia and Washington as the only States with a direct Federal program because of their decision not to have a State program. In addition, we are preparing Federal programs for eleven other States which have known coal resources but no active mining.

Following approval of a State program, Section 506 of the Surface Mining Control and Reclamation Act requires the States to re-issue all permits. OSM is developing a program to assist the States in this review process. This program consists of providing the States with teams of technical experts from Headquarters and the Technical Centers to review and to help in processing these resubmissions. This assistance will be at no cost to the States.

The physical implementation of the reorganization of OSM is now complete in the Western United States. On Monday, January 11, 1982, newly established offices were opened for business in the States of Missouri, Oklahoma, New Mexico and Wyoming; the Western Technical Service Center was opened for business in Denver, Colorado; and the Regional Offices in Kansas City, Missouri and Denver, Colorado were closed. It is particularly gratifying to note that job offers could be extended to all those employees who have elected to stay with OSM.

We are now proceeding with the planned implementation of the reorganization in the Eastern United States. In Region I, three of the four States (Virginia, West Virginia and Maryland) have already attained primacy. The Regional Director and requisite staff are conducting the review of the Pennsylvania regulatory program, which has not been approved. On April 20, 1982 the Pennsylvania Department of Environmental Resources' Environmental Quality Board adopted rule changes which have been in State rulemaking since January, 1982. These changes along with the State's legal analysis of the revisions were recently submitted as part of the Pennsylvania primacy package and are undergoing public comment until May 21, 1982. The Secretary's decision on the Pennsylvania program is expected by June 15, 1982. Until the State actually assumes the primary regulatory responsibility, ten additional OSM inspectors over and above those needed for the Pennsylvania permanent program have been retained.

In Regions II and III - Knoxville and Indianapolis - the regional offices are continuing to carry out all OSM program functions related to the interim regulatory program and the State program approval process for States which have not achieved primacy. As in Pennsylvania, seventeen additional inspectors were retained in these two regions pending State program decisions. The actual transfers of the personnel from the Regional Offices to their State Office locations are being timed to coincide with the State primacy decisions. For example, Kentucky now has primacy and the Kentucky State Office is being staffed and will assume responsibility for OSM operations in the State on May 17.

It would have been ineffective and costly to wait until all States actually achieved primacy before working out the myriad of details necessary to establish OSM's State Offices under the reorganization. It was for that reason that office localities were selected, negotiations for office space completed and offices officially established in preparation for the physical transition. Additionally, certain mandatory time tables prescribed by the Office of Personnel Management had to be followed in order to effect the transfer, relocation or separation of employees. I want particularly to re-emphasize that we have not taken any actions which would automatically result in a reduced Federal inspection workforce in any State prior to primacy.

The Fiscal Year 1983 budget request for OSM is $159.8 million, a decrease of $1.4 million from the 1983 base. Although the dollar amount of the change is slight, there are significant changes in program emphasis in Fiscal Year 1983. Grants to States rise to $111.9 million, an increase of $28.3 million. This is necessary as the States assume responsibility for their regulatory and mined land reclamation programs.

Since Fiscal Year 1983 will be marked by substantial changes in Federal regulatory program responsibilities,these increases are offset by reductions in the funding for direct Federal management of programs. The Office's regulatory responsibilities will shift from a direct enforcement role and review of State programs to program oversight and technical assistance.

It is the intent of the Act and our major goal to have States assume primary responsibility for their regulatory and reclamation programs. In Fiscal Year 1983 States will receive $29.4 million in permanent regulatory program grants, an increase of $9.4 million compared to the 1983 base. This increase is due to: (1) the first year of full implementation of some approved State programs (Pennsylvania for example); (2) State program improvements such as additional State inspector personnel as OSM inspector responsibilities decrease, and (3) establishment of management systems for review of petitions to designate areas as unsuitable for mining.

The request for administration and enforcement grants to States is based on estimates submitted by the States. These estimates are reviewed by our State or Regional Offices, discussed with the States and adjusted where necessary. Final reviews and adjustments of the estimates are made by the Headquarters staff.

The Regulatory Grants program also includes $4 million for cooperative agreements with States. These agreements - authorized by Section 523 of the Act - allow the States to assume regulatory authority over Federal lands in States which have approved permanent regulatory programs. They provide for uniform enforcement of State program requirements at all facilities within the State and reduce both Federal staff and budget requirements.

As the States assume greater regulatory responsibility, the OSM role shifts to oversight of State programs and to assistance on technical matters. The Program Operations and Inspection subactivity combines the functions of the former State and Federal Programs and Inspection and Enforcement subactivities. Total requested funding for this subactivity is $9.4 million. Changes here reflect both our diminished role in Federal regulatory program responsibility, and the transfer of the Mine Plan Review/NEPA compliance component to the Technical Support subactivity. These line item adjustments are requested to bring the budget structure in line with the current functional responsibilities of OSM organizational components.

The reduction in the inspection force is proposed in conjunction with State program approvals. By the end of Fiscal Year 1982 the Federal inspection force will be reduced to 69 full time inspectors and 13 other employees whose duties include both inspecting and responding to AML emergencies. All of these inspectors will be performing oversight and continuing direct Federal regulatory responsibility in States without approved programs and on Federal lands with no cooperative agreements. As of the end of April, there were 134 inspectors on board, reflecting the continuing interim program responsiblities in some States.

The statistical sampling oversight inspection strategy for approved State programs will ensure that the facilities which OSM inspects will be representative of the total facilities. This will enable OSM to arrive at accurate conclusions about the States' performance without inspecting every facility. The staff and dollar resources saved by this methodology are significant for the major coal producing States in comparison with an evaluation system which would involve periodic inspections of all facilities. Other on-site inspections may occur if we identify programmatic deficiencies in our program evaluation, if violations are not corrected within 10 days without good cause, or if citizen complaints justify a Federal inspection.

Significant developments which are forecast in Fiscal Year 1983 in Federal and Indian land programs include a projected reduction in the workload for review of mine plans on Federal lands from 113 in Fiscal Year 1982 to 95 in Fiscal Year 1983 and increased reliance on the States to perform the technical review of permits as they assume responsibility as the primary regulatory authority. Of the 95 mine plans to be reviewed, 48 are new plans and 47 are major modifications to existing plans. Also OSM expects to submit a report to the next session of Congress identifying legislative alternatives for surface mining control and reclamation on Indian lands. Federal requirements for this function decrease in Fiscal Year 1983.

Technical Support funding changes result from the transfer of the Mine Plan Review (NEPA), technical functions of Small Operator Assistance Program and Economic Analysis functions to the Technical Support subactivity.

The Abandoned Mine Reclamation Fund request is decreased by $700,000 from the Fiscal Year 1983 base funding level of $98.3 million. The distribution by activities reflects a decreasing Federal role as States attain primacy and begin assuming responsibility for reclamation of abandoned mine lands.

I anticipate that all of the States with regulatory primacy will have approved abandoned mine land reclamation plans by the beginning of Fiscal Year 1983. Regulatory and AML programs are processed simultaneously as much as possible in order to minimize delays in a State's AML efforts. I am pleased to inform the Committee that 10 States now have approved AML plans and an additional 6 State AML program approvals are awaiting State primacy. Three additional States with primacy have submitted AML plans which are now under review. Review of the Crow Tribe AML plan was started last week.

The request for State reclamation grants is $78.5 million, an increase of $19.4 million over the Fiscal Year 1983 base level. This funding level, representing 74 percent of anticipated State entitlement revenues from Fiscal Year 1982 collections, reflects our intent to turn over primary responsiblity for reclamation work to the States. If the States demonstrate a need for and capability to administer additional grant funds in 1983, it is anticipated that favorable consideration will be given to a supplemental request.

By Fiscal Year 1983 OSM intends to have a much improved Reclamation Fee Compliance System in effect. The Reclamation Fee Compliance System provides for on-site compliance evaluations the processing of fee information, accounting for funds collected, information, and billing for delinquent fees. Fee collections are expected to be $217 million in Fiscal Year 1983, an increase of $6.4 million.

This Administration is aware of past problems with debt collection. As of December 1981, uncollected AML fees totalled $18 million. In order to alleviate this problem, one of our major initiatives is to contract with a commercial debt collection firm to collect judgments for overdue fees. The collection contract will provide for payment based in part on amounts actually collected with no fee due for actual collection efforts in cases where the contractor is unsuccessful. In addition, OSM has sent $14 million of overdue penalty cases to the Department of Justice for collection.

Funding for Interior Reclamation Projects activities will be reduced by $18.7 million, to $9.4 in Fiscal Year 1983. This reduction is in accordance with the decision to rely primarily on the States to accomplish the backlog of reclamation project work. The Interior Reclamation Project program will focus almost entirely on emergency projects.

On the basis of our report (in response to last years' Conference Report), the 1983 funding request for the Rural Abandoned Mine Program is $3.6 million, a decrease of $1.4 million. This funding level allows for continuation of all active projects. The decrease is consistent with our shift of responsibilities to the States. For future years, the States should review these projects to assure that project selection is based on the Act's priorities and in conformance with the State's overall reclamation plan. The States can then decide when it is advantageous to use the RAMP/Soil Conservation Service delivery mechanism through agreements with the State/SCS committees or local conservation districts. For this purpose, future appropriations could include additional State grant amounts from the discretionary or Federal portion of the fund.

Finally, the request for the General Administration subactivity is $9.6 million which is about $3 million less than the 1983 base. This is possible because of major savings attributed to completion of our reorganization.

In closing, Mr. Chairman, I would like to say that the Administration's Fiscal Year 1983 budget proposal is sound and efficient to carry out the Agency's mission.

I would also like to thank this Committee for allowing me this opportunity to highlight our budget and for its continued and considerate support of our activities.

## James R. (Dick) Harris, Director

Mr. Harris was appointed by President Reagan as Director, Office of Surface Mining which is responsible for the implementation of the Federal coal mining and reclamation standards.

Mr. Harris, a certified professional geologist has both technical and practical experience in the coal mining industry.

A native of the State of Indiana, he graduated from Indiana University in 1951. During his business and professional career Mr. Harris has worked as a consulting geologist in both the coal and petroleum industries, served as a mine superintendent in the surface coal mining industry, developed several business interests and served in both the Indiana Senate and the Indiana House of Representatives.

## J. Steven Griles, Deputy Director

Mr. Griles was appointed Deputy Director of the Office of Surface Mining (OSM) June 18, 1981. Prior to this appointment, Mr. Griles was the Assistant Director, Inspection and Enforcement for OSM.

From 1971 to 1981, Mr. Griles served the Virginia Department of Conservation and Economic Development in several different capacities. From 1971 to 1973 Mr. Griles functioned as a staff assistant for the Department. From 1973 to 1978 he operated as a Program Manager. From 1978 until his appointment with OSM he served as the Executive Assistant providing technical guidance, as well as providing analyses and evaluations in mining and reclamation.

Mr. Griles holds a B.A. degree from the University of Richmond and served with the Virginia Army National Guard from 1970-1978.

Mr. Griles resides in Reston, Virginia with his wife, Casey, and son, Matthew.

**Dean K. Hunt, Assistant Director - Technical Standards and Research**

Mr. Hunt was born in Troy, New York in 1949. He holds a B.S. degree in Engineering from Bucknell University, 1971; a M.S. degree in Engineering from Bucknell University, 1979; and a J.D. from the University of Louisville, 1977, where he graduated Magna Cum Laude. Mr. Hunt is also a registered Professional Engineer.

Prior to his appointment as Assistant Director of the Office of Surface Mining, Mr. Hunt was employed by D'Appolonia Consulting Engineers in Pittsburgh, Pennsylvania. Mr. Hunt was involved in areas such as coal mining evaluations; mine design; permitting; analysis of regulatory programs; design of off-shore structures, ports, and hazardous waste disposal facilities; and preparation of environmental assessments.

## William B. Schmidt, Assistant Director
## Program Operations and Inspection

Mr. Schmidt is a mining engineer with broad knowledge of coal mining practices both in the United States and overseas. Mr. Schmidt was recently appointed Assistant Director, Program Operations and Inspection for the Office of Surface Mining (OSM), Department of the Interior. In this position he is responsible for oversight of State enforcement operations where States have achieved primacy, enforcement of Federal regulations, Abandoned Mine Land reclamation grants to the states, agreements with the States and Tribes, and other related matters.

Prior to beginning work for OSM, Mr. Schmidt was the Director, Office of Coal Mining, Department of Energy (DOE). He was responsible for DOE's research efforts in the areas of coal mining, preparation, and transportation. He was the department's principal technical expert in the coal mining area. He has made numerous technical visits to coal mines and institutes in England, France, Germany, Poland, Russia, and China.

Prior to his transfer to DOE in October 1977, he was Chief of the Division of Mining Research-Resources in the Bureau of Mines, Department of the Interior. It was in this organization that he begain the coal production research program in 1974. Between joining the Bureau in 1971 and his promotion to Division Chief in 1974, Mr. Schmidt served as a Staff Engineer and established and headed the Computer Sciences Corporation.

Mr. Schmidt is a graduate of the Colorado School of Mines (CSM), Golden, Colorado. He holds two professional engineering degrees (Engineer of Mines and Geologic Engineer) from CSM. He also has received a MBA from the Bernard M. Baruch School of Business in New York City.

## Carson W. (Pete) Culp, Jr.
Acting Assistant Director
Management and Budget

Mr. Culp's 22 years of Federal service includes three years with the U.S. Army. He was competitively selected for the Department's first Senior Executive Candidate Development Program, completing a year-long program of part-time training on top management.

As the Office of Surface Mining's (OSM) financial manager, Mr. Culp has been responsible for developing and managing the agency's budget and financial affairs. Before joining OSM, he served as Chief of the Budget Branch of Interior's Bureau of Land Management (BLM).

From 1968 to 1969, he performed liaison work with the U. S. Treasury Department on behalf of the Executive Office of the President, Bureau of the Budget, Resources Systems Staff. In 1970, Mr. Culp held a staff position on the Senate Appropriations Committee.

Since 1970, Mr. Culp has received a total of five special achievement awards from OSM and BLM.

Born in Washington, D. C. in 1939, he earned his Bachelor of Science degree in accounting at Pennsylvania State University in 1961. Mr. Culp lives in Arnold, Maryland, with his wife and four children.

Mr. YATES. Mr. Harris, we would be glad to have you discuss the highlights of your program.

Mr. HARRIS. Thank you, Mr. Chairman.

Mr. YATES. Last year we gave you funds for an extra thirty-one inspectors as I remember. Were they well used, or did you not use them?

Mr. HARRIS. As I remember, we had fewer inspectors than we actually needed because some of the State programs were not approved on schedule.

As a result, we came back and asked for an additional appropriation which we received to keep some additional inspectors on the job.

Mr. YATES. All right. You may proceed, Mr. Harris.

Mr. HARRIS. Mr. Chairman, I am pleased to have this opportunity to appear before you to present and support the President's fiscal year 1983 budget request for the Office of Surface Mining.

The major program accomplishments and policy assumptions which were the basis for this budget request include significant regulatory reform, a major reorganization, and the approval of State programs in the principal coal-producing States. My staff has attempted over this period of change to keep this committee and its staff fully informed of our activities in an effort to better foster communications and thus a better relationship between OSM and the committee.

We certainly hope these efforts have been productive. Our reorganization is now complete in the West and should be completed in the East by the end of July of this year. Only four more State programs remain to be approved—those of Tennessee, Pennsylvania, Ohio and Indiana. Both our East and West Technical Centers are now operational. Our regulatory reform effort should be completed by November 1, 1982. We believe that our efforts toward regulatory reform have brought and are continuing to bring answers to many of the legal and technical problems which have plagued the Agency since its original regulations were issued.

The fiscal year 1983 budget request for OSM is $159.8 million, a decrease of $1.4 million from the 1983 base.

Significant program changes and budget shifts in this budget proposal reflect the changing role of the States and OSM as all of the primary coal-producing States receive primacy. We believe that this budget, as it is being presented today, is adequate to allow the Office of Surface Mining to carry out its functions as the oversight Agency in the enforcement of Public Law 95-87, the Secretary's regulations, to assist the States in the solution of technical problems, to fund its mandated share of State programs, and to finance abandoned land mine projects at the State and Federal levels.

That, sir, is my statement.

Mr. YATES. How many States have not achieved primacy?

Mr. HARRIS. Four.

Mr. YATES. Alabama and Illinois have been approved?

Mr. HARRIS. Yes.

## OVERSIGHT INSPECTION

Mr. **Yates**. What do you do after primacy is achieved to make sure that they are complying with the law?

Mr. **Harris**. OSM carries out its oversight inspection role. As you are aware, and as was discussed last year in these hearings, we have used a statistical sampling method to set up our oversight policy. This sampling method indicates that to have a 95 percent reliability in the inferences from our oversight inspections, we must inspect, in total, 17 percent of the inspectable facilities on an annual basis.

Mr. **Yates**. Have you been conducting those inspections?

Mr. **Harris**. Yes.

Mr. **Yates**. What have they shown?

Mr. **Harris**. We have completed reports on two States, Montana and Texas. In those States it appears that they are doing an adequate job. We believe that with the close cooperation and the almost daily communications between the States and the OSM State offices, that we will be able to be on top of the States' program, and be able to very closely monitor what they are attempting to do.

Mr. **Yates**. How many Federal inspections have you been able to conduct in fiscal year 1982 to date? Do you have any record of those?

Mr. **Harris**. We don't have that information, sir. We will submit it for the record.

[The information follows:]

# FEDERAL INSPECTIONS BY CATEGORY

REPORT IAS002

U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF SURFACE MINING
INSPECTION ACTIVITY FOR 10/01/81 - 03/31/82

05/20/82
PAGE 1

| | NUMBER OF COMPLETE | INSPECTIONS PARTIAL | TEN DAY NOTICES | NOTICES OF VIOLATION | CESSATION ORDERS | CITIZEN COMPLAINTS | NUMBER OF VIOLATIONS |
|---|---|---|---|---|---|---|---|
| REGION 1 | | | | | | | |
| MARYLAND | 0 | 102 | 0 | 0 | 0 | 2 | 0 |
| PENNSYLVANIA | 1,997 | 793 | 0 | 106 | 16 | 39 | 188 |
| VIRGINIA | 122 | 140 | 0 | 31 | 13 | 8 | 95 |
| WEST VIRGINIA | 15 | 1,098 | 0 | 1 | 0 | 1 | 1 |
| REGIONAL TOTAL | 2,134 | 2,133 | 0 | 138 | 29 | 50 | 284 |
| REGION 2 | | | | | | | |
| ALABAMA | 793 | 109 | 0 | 32 | 25 | 31 | 65 |
| GEORGIA | 10 | 21 | 0 | 5 | 1 | 0 | 10 |
| KENTUCKY | 1,932 | 832 | 0 | 314 | 72 | 198 | 759 |
| TENNESSEE | 318 | 260 | 0 | 128 | 39 | 44 | 376 |
| REGIONAL TOTAL | 3,053 | 1,222 | 0 | 479 | 137 | 273 | 1,210 |
| REGION 3 | | | | | | | |
| ILLINOIS | 342 | 147 | 0 | 39 | 0 | 2 | 46 |
| INDIANA | 488 | 249 | 0 | 135 | 47 | 9 | 318 |
| OHIO | 1,007 | 287 | 0 | 108 | 9 | 7 | 180 |
| REGIONAL TOTAL | 1,837 | 683 | 0 | 282 | 56 | 18 | 544 |
| REGION 4 | | | | | | | |
| ARKANSAS | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| IOWA | 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| KANSAS | 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| MISSOURI | 4 | 7 | 0 | 0 | 0 | 0 | 0 |
| OKLAHOMA | 104 | 87 | 3 | 6 | 0 | 18 | 8 |
| TEXAS | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| REGIONAL TOTAL | 108 | 108 | 3 | 6 | 0 | 22 | 8 |
| REGION 5 | | | | | | | |
| ALASKA | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARIZONA | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| COLORADO | 4 | 21 | 1 | 0 | 0 | 1 | 1 |
| MONTANA | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| NEW MEXICO | 5 | 11 | 0 | 1 | 0 | 0 | 1 |
| NORTH DAKOTA | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OREGON | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| UTAH | 2 | 2 | 0 | 0 | 0 | 1 | 0 |
| WASHINGTON | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| WYOMING | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| REGIONAL TOTAL | 19 | 39 | 1 | 1 | 0 | 2 | 2 |
| GRAND TOTAL | 7,151 | 4,185 | 4 | 906 | 222 | 365 | 2,048 |

## REPERMITTING

Mr. **Yates**. The act says that every mining facility must be repermitted within the first 8 months of primacy. Is that being done?

Mr. **Harris**. In those States that have large numbers of facilities to be repermitted, we have set a schedule that goes beyond the 8-month limitation in the act because, for example, in a State like Kentucky, which has about 6,000 applications, it would be impossible to have them adequately reviewed within 6 months.

We discussed this with environmental groups and with the States, and all of us were in agreement that reasonable schedules should be set so that they would do an adequate job in reviewing these permits.

Mr. **Yates**. What kind of a rescheduling are you doing?

Mr. **Harris**. In the case of Kentucky, we have extended the schedule to 20 months. We feel that is the minimum time in which they could adequately review their permit applications. I think it is in the interest of everyone to have these applications adequately reviewed so that the information is meaningful and correct, rather than to have them submitted and reviewed in some half-way manner.

Mr. **Yates**. How is the repermitting process done? Do you establish some kind of a requirement for a joint examination? What do you do?

Mr. **Harris**. The repermitting is handled principally by the States. But we have set up a method to furnish technical assistance in this review to the States if they need and request it. We will have teams from each technical center that will be available to these States at their request, and we can send them in groups of about six at a time.

If they need two groups, we can dispatch those people.

## STATE INSPECTIONS

Mr. **Yates**. Have all the States established adequate inspection forces to make sure the provisions of the act are being complied with?

Mr. **Harris**. We believe that the States that have received primacy thus far do have an adequate number of inspectors.

Mr. **Yates**. Otherwise you wouldn't have provided them with primacy?

Mr. **Harris**. That is right. That is a part of the program review, sir.

Mr. **Yates**. What is required to be done by an inspector in making an inspection?

Mr. **Harris**. The State inspectors, who practically live in the mines that they are inspecting, can be a great deal more efficient in their inspections than an OSM inspector who only sees them at most on an annual basis, or maybe not even that often.

Mr. **Yates**. How long does it take an inspector to inspect a facility?

Mr. **Harris**. That again depends in great degree on the type of mine they are inspecting. Given the situation in the East where you may have half a dozen small mines on one mountainside, they can move very rapidly in inspecting those. If you have a large area mine in the Midwest, it is going to take longer to get over the territory necessary.

We feel that a State inspector will probably be able to handle an average of about 300 inspections per year. Our OSM inspectors cannot make that many inspections for the simple reason that they will be going back and reviewing the permit, the mine plan, and carrying out their inspection, whereas the inspector at the State level will be completely familiar with those before going on the site because he works with them on a daily basis.

Mr. YATES. What does an inspector cover when inspecting a mine? What is he supposed to make sure of?

Mr. HARRIS. He will inspect the mine to make sure that the mining process and the reclamation process are in keeping with all the provisions of the permit and the regulations.

Mr. YATES. What does that encompass? What must be inspected to keep in line with the regulations?

Mr. HARRIS. Well, he must inspect the sedimentation ponds to make sure that they are adequate to handle the runoff from the mine site. He will normally check the effluent water leaving those pits—sedimentation ponds. He will check for concurrent reclamation. He probably will check blasting procedures and a multitude of other things.

Mr. YATES. I am trying to find out what has to be inspected in order to see how much time an inspector needs to spend on this job. So far, you have indicated four areas of inspection: Sedimentation ponds, effluent water runoff, concurrent reclamation, and the blasting procedures.

Mr. HARRIS. He will also look at their revegetation situation.

Mr. YATES. How many regulations are there that the inspector has to review for compliance?

Mr. HARRIS. There are in the neighborhood of 60 areas that he will cover.

Mr. YATES. Sixty areas. Are all 60 areas reviewed in each inspection?

Mr. HARRIS. The 60 areas will reflect compliance or noncompliance with 28 performance standards he has to cover. But not every job will have all of the inspectable situations.

So, it varies job-by-job, what he does and doesn't have to inspect.

Mr. YATES. Is an inspection chart of some type used to check off these 60 areas? How does the inspection procedure work?

Mr. HARRIS. In the cases where States are the primary regulatory authority, they will set up the inspection procedures. In our case we will have checkoffs.

Mr. YATES. When a State sets up an inspection procedure, do they require their inspectors to make the same kind of inspections that you have just described?

Mr. HARRIS. Yes.

Mr. YATES. Does Federal law require that?

Mr. HARRIS. Yes.

### REVOKING PRIMACY

Mr. YATES. Can you take primacy away from a State?

Mr. HARRIS. Certainly, primacy may be withdrawn.

Mr. **Yates**. What is the occasion in which you can take primacy away from a State?

Mr. **Harris**. If we were to find that a State repeatedly is not enforcing the act or regulations in any given area, the Director has the authority to notify them by letter that he is removing their approval and will install a Federal program. It may be a partial or complete withdrawal of primacy. We had to come very close to that in one case a while back in Oklahoma, where the legislature had remanded the regulations during its annual session. I personally made a trip to Oklahoma, along with some of my staff. We explained to the States that if they didn't get these regulations back on the books very rapidly, we would have to revoke their program approval. That is an area in which I am not hesitant about exercising that authority.

### OKLAHOMA PROGRAM

Mr. **Yates**. Let's take a look at Oklahoma. In fiscal year 1982, Oklahoma had 272 regulated facilities, required annual inspections were 3,264. They had five State inspectors in February of 1982. Which means that the annual inspections per inspector were 652. I think it is pretty impossible that each of them would make that many inspections.

Mr. **Harris**. I would have to look at their record of total inspections to determine that. You have a mixture of mines in Oklahoma, mostly rather small. It is one of the States in which that might be a possibility.

Mr. **Yates**. You say you went to Oklahoma. What did you look for?

Mr. **Harris**. I met with their people, sir. I did not inspect mines while I was there.

Mr. **Yates**. Did any Federal inspectors inspect the mines to see whether or not the laws were being complied with?

Mr. **Harris**. Yes, we have had Federal inspectors inspecting in Oklahoma.

Mr. **Yates**. Did they report back that the laws and regulations were being complied with?

Mr. **Harris**. Yes, sir, it is my understanding that they did.

Mr. **Yates**. How is that possible with so many inspections? Do you have the report of that inspection?

Mr. **Harris**. No, I don't have it with me, sir.

Mr. **Yates**. It doesn't make sense, does it, based on the numbers themselves? How is it possible for five inspectors to make 652 inspections?

Mr. **Harris**. There is always the possibility that not all of those inspectable facilities are active at any one given time, which would allow them to observe very rapidly whether or not there had been any change from the previous inspections.

[**Committee note**: Subsequent to the hearing, OSM informed the committee that their information indicates there are about 90 active mining operations in Oklahoma at present.]

Mr. **Yates**. You said you went down and met with the people from Oklahoma.

Mr. **Harris**. Yes.

Mr. YATES. What were you meeting about?

Mr. HARRIS. I was meeting about the regulations which they remanded, and that it was absolutely necessary to get the regulations back on the books as rapidly as possible. If not, we would have to install a Federal program.

Mr. YATES. Are the regulations back on the books?

Mr. HARRIS. Yes, sir.

### OVERSIGHT POLICY

Mr. HARRIS. If our oversight inspections indicate that they are not making the necessary number of inspections, or that their inspections are not adequate, then we have the authority to require that they hire additional inspectors to catch up on the workload. And we will look at that very closely.

Mr. YATES. Apparently you don't propose to evaluate the State inspections until next year, do you? The earliest is next March.

Mr. HARRIS. No, we are in the process now of evaluating the State programs, and we should have an interim report by about June 15th for each of the States that have had primacy for any lengthy period.

Mr. YATES. I see. Your reports are going to be made in April of 1983, and you are in the process of preparing the underlying material for those reports now?

Mr. HARRIS. Well, we have an interim oversight program, the reports from which are due in June. And then we will have our permanent oversight program as you mention there.

Mr. YATES. Was OSM's directive of July 18, 1981, on oversight policy, superceded?

Mr. HARRIS. Yes, that was the interim oversight policy.

Mr. YATES. Why was that superceded?

Mr. HARRIS. It was superceded by the permanent oversight policy.

Mr. YATES. I see. What changes were made?

Mr. HARRIS. Well, the permanent oversight policy is quite different than the interim oversight policy in what is covered. This policy was worked out jointly between the operators, the States, and OSM. It reflects the statistical method of sampling, rather than the large number of inspections that were necessary under the interim program.

Mr. YATES. Does "a statistical method of sampling" mean you won't be making total inspections, but only a specific number?

Mr. HARRIS. We will be making complete inspections, but this is based on the 17 percent statistical sampling method, rather than annual inspections for every inspectable facility.

Mr. YATES. Does that mean you will be making inspections on 17 percent of all the facilities in the country?

Mr. HARRIS. It means that we will be inspecting 17 percent of the total facilities. In States that have very small numbers, where the number is small, for example five mines, all of these will be inspected every year. In a State where you have maybe 6,000 inspectable facilities, then the sample is much larger; however, the number to be inspected is a much smaller percentage of the total.

## KENTUCKY INSPECTIONS

Mr. **Yates**. What are you going to do in Kentucky? They have 67,000 inspectable facilities?

Mr. **Harris**. Kentucky has about 6,000 inspectable facilities.

Mr. **Yates**. It says requiring annual inspections. At least the figure the staff has given me indicates that you have regulated facilities in Kentucky totaling 5,638 which will require 67,656 annual inspections.

Mr. **Harris**. The State inspectors will be doing those inspections. We will just be doing the oversight inspections, sir.

Mr. **Yates**. Will that be the 17-percent figure that you talked about?

Mr. **Harris**. Yes. It is numerically different than 17 percent in each State.

In Kentucky the percentage will be less than 17 percent of the total facilities. In Wyoming it will be 100 percent of the total facilities. It is just the way the statistical study breaks down. That is, as the population increases, the sample size increases; but the samples as a percentage of the population decreases.

Mr. **Yates**. How many Federal inspectors are on the payroll now?

Mr. **Harris**. We have 134 inspectors at this time, sir.

Mr. **Yates**. 134 inspectors?

Mr. **Harris**. Yes. That was as of May 1, 1982.

Mr. **Yates**. Will you still have 134 for fiscal year 1983?

Mr. **Harris**. No, we will have 69 full-time inspectors after the major producing States have received primacy.

Mr. **Yates**. How will they be distributed?

Mr. **Harris**. Well, the statistical sample would indicate we have to make 3,157 inspections on the general type mining operation. We have nine Indian mines that will require 84 inspections. We have a Federal program in Georgia and Washington which will require 180 inspections, which leaves us a buffer of 1,423 inspections for followups and citizens' complaints. In addition to those 69 inspectors we have 14 half-time inspectors that can be utilized, which would give us an additional capacity of 490 inspections, which would put us up over 1,900 as a buffer to take care of followups and citizens' complaints.

Mr. **Yates**. What does that average then? Well, you can't average. You have different inspectors in different places. Where will your inspectors be located?

Mr. **Harris**. Our inspectors will be located in the States, sir.

## STATE OFFICE STAFFING

Mr. **Yates**. In the States. So, that you are going to have some States with two inspectors, and some with one.

Mr. **Harris**. Yes.

Mr. **Yates**. If you have 69 inspectors, apparently, there would be 19 States where you have two inspectors. In which of the States will you have two inspectors?

Mr. **Harris**. I have to get a breakdown on that. We will have to submit it for the record, sir. We don't have it with us today.

Mr. **Yates**. Well, will there be any States where you have more than two?

Mr. **Harris**. Oh, yes.

Mr. **Yates**. What States will you have more than two?

Mr. **Harris**. We will have more than two in Kentucky, West Virginia, Virginia, Illinois, Pennsylvania, and Indiana. Major coal producing States will have several.

Mr. **Yates**. How many is several? How many more than two will you have in Kentucky or the other major coal producing States?

Mr. **Harris**. I am not sure of that number. I will have to submit it for the record, but it is a sizeable number of inspectors.

Mr. **Yates**. It can't be a sizeable number unless there are States where you won't have any inspectors?

Mr. **Harris**. We will have some areas in which we will have probably one inspector covering more than one State. Since we have the Federal program in Washington, they have one surface mine, Alaska has one surface mine.

So, the inspectors there will cover more than one State. In Georgia there are one to two surface mines at any given time.

Mr. **Yates**. What is the maximum number of inspectors you will have in any State?

Mr. **Harris**. I believe, and this is off the top of my head, sir, I don't have the figure with me, but I believe eight is the most we will have in any one State. I will have to check that.

[The information follows:]

### DISTRIBUTION OF THE 69 INSPECTORS BY STATE

| OSM office location | States served | Inspector staffing |
|---|---|---|
| Alabama | Alabama, Georgia | 7 |
| Illinois | Illinois | 3 |
| Indiana | Indiana | 3 |
| Kentucky | Kentucky | 12 |
| Missouri | Missouri, Kansas, Iowa | 2 |
| New Mexico | New Mexico, Colorado, Utah, Navajo and Hopi Reservation | 2 |
| Oklahoma | Oklahoma, Texas, Arkansas, Louisiana | 2 |
| Ohio | Ohio, Michigan | 5 |
| Pennsylvania | Pennsylvania | 10 |
| Tennessee | Tennessee | 5 |
| Virginia | Virginia | 5 |
| West Virginia | West Virginia, Maryland | 11 |
| Wyoming | Wyoming, North Dakota, Montana, Crow Reservation, Washington, Oregon, Alaska, Idaho. | 2 |

### OSM KENTUCKY STATE OFFICE STAFFING

Mr. **Yates**. I assume that those eight will be in Kentucky, won't they?

Mr. **Harris**. I would say so, yes. If the number actually is eight, the largest number would be in Kentucky. We will have 24 total people in Kentucky in that State office.

Mr. **Yates**. 24 total people. How many of them will be inspectors?

Mr. HARRIS. That is the number I don't have with me, sir. I will have to submit it for the record.

Mr. YATES. How do you know you will have 24 people?

Mr. HARRIS. I have the numbers here in front of me.

Mr. YATES. Oh. You don't have a breakdown?

Mr. HARRIS. I have a total for inspection and enforcement, but I don't have a breakdown of inspectors.

Mr. YATES. Does that 24 figure indicate what the noninspectors will be doing?

Mr. HARRIS. We have clerical and support staff for these people among that 24.

Mr. YATES. Does your information indicate how many clerical and support staff people you will have?

Mr. HARRIS. No, it doesn't. I don't have a breakdown on the figures, sir. I only have the total.

Mr. YATES. It doesn't give us very much information, then, does it?

Mr. HARRIS. Sir?

Mr. YATES. You're not providing the committee with very much information as to what kind of position you will be in with regard to oversight?

Mr. HARRIS. Well, I think the fact that we will have sufficient numbers in each of those States to carry out the number of inspections which the statistical sampling method indicates should give assurance to the committee that the oversight policy will be carried out in a proper manner.

Mr. YATES. Let's take Kentucky's 5,638 required annual inspections.

Why are you recommending only 360 inspections in Kentucky? Ten percent of inspectable units would be 563. Seventeen percent would be obviously almost twice that, about 950. Yet the figure shown for sampling inspection is 360.

Mr. HARRIS. Well, the statistical sample required in Kentucky is based on 6,000 operations. The percentage of inspections required would not approach 10 percent. It drops drastically when you have large populations to sample from.

Mr. YATES. What does the 17 percent figure mean then?

Mr. HARRIS. It is a 17 percent average nationwide figure, sir.

Mr. YATES. How many inspections will you have in Kentucky?

Mr. HARRIS. We will have a total of 804 inspections in Kentucky.

Mr. YATES. What does the figure 360 mean on the chart that has been given to the committee?

Mr. HARRIS. Kentucky has 5,638 inspectable units, and the sample for oversight is 360 or 6 percent of that figure. The size of the sample in Kentucky indicates that we should inspect 6 percent of the inspectable facilities there, which gives us the 360 figure.

Mr. YATES. What would the 804 figure be?

Mr. HARRIS. The 347 that you find in another column is the followup inspections that we expect to make.

Mr. YATES. Yes.

Mr. HARRIS. And the 97 are the citizens' complaint inspections we expect to make, giving you a total of 804.

To answer your previous question, sir, there are 12 inspectors in Kentucky. My estimate of eight was low.

Mr. **Yates**. How do you know now that there will be 12 inspectors in Kentucky?

Mr. **Harris**. We did some backwards mathematics on from how many inspections had to be done to how many inspectors it would take to do that and we know that we have an adequate force there to do it.

Mr. **Yates**. I see. Well, there are 12 inspectors in Kentucky. Deduct 12 from 69, right?

Mr. **Harris**. Yes.

Mr. **Yates**. And you have 57 for the rest of the country besides Kentucky.

Mr. **Harris**. Right. Kentucky has by far the most inspectable units.

### OSM INSPECTORS IN OTHER STATES

Mr. **Yates**. What number of inspectors does your mathematics show you will have in Pennsylvania?

Mr. **Harris**. We will have ten in Pennsylvania, sir.

Mr. **Yates**. How many are you going to have in West Virginia?

Mr. **Harris**. West Virginia. My mathematician is working on it here. We will have eight inspectors in West Virginia.

Mr. **Yates**. So, out of 69 inspectors, 30 of them are for three States. How many are you going to have in Alabama?

Mr. **Harris**. We will have about five inspectors in Alabama.

Mr. **Yates**. How many are you going to have in Virginia?

Mr. **Harris**. We will probably have six inspectors in Virginia.

Mr. **Yates**. Six in Virginia.

That is 41 inspectors out of 69 in five States—doesn't leave very many for the rest of the country.

Mr. **Harris**. I also have those 14 people additional, sir, in reserve who are half-time inspectors.

Mr. **Yates**. They must be sprinters.

Mr. **Harris**. They provide capability for an additional 490 inspections. I assure you, however, that we will have enough inspectors to handle the oversight inspections at the rate that the statistical sample shows that they should be inspected. And as has been the case in the past, when I found I was short of inspectors, I was not backwards about coming back up and asking for an additional appropriation to raise that number, as indicated by what we did last year.

Mr. **Yates**. Last year the committee, on its own, gave you 31 additional inspectors. The committee decided you didn't have enough people to do the necessary inspections. September 30th you came in with a budget amendment. The committee had already acted and given you the extra 31 inspectors.

I do not know how you are going to do it. I do not think you are going to do a good job. I really don't. I do not think you have enough people to do a decent job here.

Mr. **Harris**. If we are going to rely on a statistical method, and that is the only method we can use——

Mr. **Yates**. Why is that the only method that you can use?

Mr. **Harris**. Sir, I would draw an analogy here. When a person is running for an election and he wants to get an idea on how well he is running in his district, he doesn't go out and poll every voter. He takes a statistical survey and arrives at a percentage of the voters that he feels favor his election at that point.

Mr. Yates. Are you going to have the same method for your oversight, are you going to call up the mine operators and ask them how well they are doing?

Mr. Harris. No, we are going to do it on the job site. On the other hand, it isn't necessary for the Federal Government to duplicate the States' inspections, or there is no reason to have State inspectors doing the inspections. We are doing oversight inspections.

Mr. Yates. Doing an adequate job assumes that the State inspectors are numerous enough to do the job, doesn't it?

Mr. Harris. That is correct.

### KENTUCKY INSPECTIONS

Mr. Yates. Well, let's look at Kentucky. Kentucky has regulated facilities numbering 5,638. It has required annual inspections of 67,656. It has 135 State inspectors, as of February 1982.

Mr. Harris. Yes.

Mr. Yates. Each of those inspectors will be required to make 501 annual inspections. Again, can one inspector make 500 inspections annually?

Mr. Harris. You will notice their fiscal year 1983 projection raises that number to 156 inspectors. I think that was our requirement with the approval of——

Mr. Yates. Well, that reduces it only to 434. Can one inspector do 434 inspections? How many inspections can an inspector make, if he has 60 items to check?

Mr. Harris. Well, he is not going to be checking all of those items at all the facilities.

Mr. Yates. We are talking about State inspectors now.

Mr. Harris. Yes. Many of the performance standards are standards that are not applicable to every mine site, depending upon what their method of mining is. To give you some idea of what they have done in the past, in 1981, with 104 inspectors, Kentucky completed 51,381 inspections.

Mr. Yates. Would you give me that figure again?

Mr. Harris. 51,381.

Mr. Yates. What is the 51,000?

Mr. Harris. That was the total inspections by State inspectors in Kentucky, using 104 inspectors, in 1981. And you have to realize, too, that some of these are partial inspections, and some of them are full inspections. It takes much less time to do a partial inspection than a total inspection.

### OKLAHOMA INSPECTIONS

Mr. Yates. Well, let's look at Oklahoma again. It has 272 regulated facilities, and required annual inspections of 3,284. As of February 1982, Oklahoma had five inspectors, and five projected for 1983 as well. So each inspector would be required, each inspector would be required to make 652 annual inspections. That is a lot, isn't it?

Mr. Harris. Yes, sir, that is a lot of inspections.

Mr. **Yates**. Yes.

Mr. **Harris**. Now, we will have available for you on June 15 a complete report on whether or not in fact those States are doing the required number of inspections.

Mr. **Yates**. On June 15th?

Mr. **Harris**. Yes, sir. It will come to me on June 15 and I will supply you with it shortly thereafter.

[Committee note: At the time the record was closed, the report had not been provided.]

Mr. **Yates**. Is there an average number of inspections that a State inspector can make, should have to make?

Mr. **Harris**. No, the mining practices in various areas are too different. The time it takes you to get from one mine to another, the type of mine, the topography, and so on makes a great deal of difference on how many inspections can be carried out by an inspector in one State as opposed to another.

### WEST VIRGINIA INSPECTIONS

Mr. **Yates**. Right. West Virginia is a pretty hilly State, isn't it?

Mr. **Harris**. Yes, sir.

Mr. **Yates**. West Virginia has 3,409 regulated facilities. It is going to have 40,908 required annual inspections. It has, as of February 1982, 74 inspectors. So that the annual inspections required per inspector was 553. The number of inspectors projected for 1983 is the same number, 74.

So, each inspector will have to make 553 inspections. They will have to use helicopters.

### AERIAL INSPECTIONS

Mr. **Harris**. In some cases he is going to use helicopters to do partial inspections.

Mr. **Yates**. How many helicopters will West Virginia provide their State inspectors?

Mr. **Harris**. They have two at this time. They can only do so many each year with that type of inspection. But, if you know West Virginia mining, in many cases you can drive down one valley and find half a dozen mines which an inspector might very well cover in 1 day. They are small operations. There are not a lot of things to inspect.

Mr. **Yates**. Does he come down from the air when he inspects them, or does he inspect them from the air?

Mr. **Harris**. He can inspect them from the air or he can land.

Mr. **Yates**. Well, if memory serves me right, your regulations do not permit aerial inspections, do they?

Mr. **Harris**. The regulations have been changed to allow for partial aerial inspection.

Mr. **Yates**. When did you change the regulations?

Mr. **Harris**. They will be changed very shortly.

Mr. **Yates**. That is kind of like——

Mr. **Harris**. It is in the rulemaking process at this time.

Mr. **Yates**. I see. It is kind of like having a date with somebody prospectively, isn't it? Well, we will have to wait.

### AVERAGE NUMBER OF STATE INSPECTIONS

Alabama does pretty well too, doesn't it? You have 1,000 regulated facilities, and required annual inspections of 12,624. State inspectors in February numbered 18. So as of February 1982, the annual inspections per inspector were 701.

In fiscal year 1982 the number of inspectors is going to be increased to 28. So, you are going to have each inspector being required to inspect 451 installations. These are going to have to be very fast inspectors, aren't they?

Mr. HARRIS. The average inspector in Kentucky last year inspected about 500 facilities.

Mr. YATES. I thought you told me you couldn't have an average?

Mr. HARRIS. I can have an average for a State. I can't meaningfully average all States.

Mr. YATES. And the average in Kentucky was how much?

Mr. HARRIS. About 500.

Mr. YATES. Would you say that was an adequate inspection that they made in Kentucky?

Mr. HARRIS. I believe it probably was. Since I was not at the site, I can't be an absolute judge of that.

Mr. YATES. Well, you had 12 inspectors who were on the site. What did they tell you?

Mr. HARRIS. Yes. Kentucky was in the interim program. And I think Kentucky was carrying out its interim program very well with OSM presence. Kentucky just attained primacy, and we will have to observe them very closely to see if they continue that kind of a high level of input.

Mr. YATES. Is there an average inspection per inspector in West Virginia?

Mr. HARRIS. We could figure out the average in a given year from how many inspections and how many inspectors. Four hundred was the average in 1981.

Mr. YATES. 400 is the average. Well, next year they will be required to make 553, won't they? Which means that the inspections won't be any good, or excuse me, won't be comprehensive enough. That is the only conclusion you can draw, if they are going to make all the inspections.

### CONDITIONAL PRIMACY

Some of your States that have been given primacy have conditions on their primacy. How many such States are there?

Mr. HARRIS. I believe most of the States that have approved programs do have some conditions. I believe there are 13 States with conditions at this time.

Mr. YATES. What is the nature of the condition?

Mr. HARRIS. The conditions can be of a broad range. Some of the conditions are predicated on legislative changes that need to be made.

Mr. YATES. Such as what?

Mr. HARRIS. Oh, in Indiana's program, for instance, there are civil penalties for the type of misdemeanor that might be adjudged under the act to not carry the same penalties that the Federal act requires.

So, that would probably take a legislative change. The Secretary conditions these programs in such a manner that the State cannot enforce its regulations with those conditions, but must enforce the Federal regulations in those areas in which the act is conditioned so it does not interfere or lessen their enforcement activities.

Mr. YATES. How long do you allow a State to have conditions and still retain their primacy?

Mr. HARRIS. It depends upon the type of condition. If it is a condition that requires legislative changes, many of the States have legislatures that meet only for short periods each year. Some of them, such as Kentucky, have a legislature that meets only every 2 years. So, the time for the condition to be corrected is usually based upon the time that we feel would be necessary for the State to effect that correction.

Mr. YATES. Does OSM have any responsibility in monitoring program elements that have not yet been approved?

Mr. HARRIS. I am sorry, sir. I don't understand the question.

Mr. YATES. Well, Do you have a responsibility for making sure that conditions you have imposed in order for States to achieve primacy are met?

Mr. HARRIS. We have responsibility to make sure that the conditions are corrected by a certain time, but we do not have any enforcement responsibilities as far as those conditions are concerned. The conditional approval is predicated on the fact that they will impose the Federal regulations, and not the regulations in their program which are conditioned.

### OKLAHOMA PROGRAM'S CONDITIONS

Mr. YATES. Let's discuss Oklahoma a minute. You indicated that you had talked to some of the people in Oklahoma. I assume for the purpose of persuading them that you were going to take away Oklahoma's primacy in the event that they didn't meet certain conditions?

Mr. HARRIS. That is correct.

Mr. YATES. Can you tell us what those were?

Mr. HARRIS. Well, they had remanded their entire set of regulations.

Mr. YATES. All right. Now, they have passed those regulations and they are in existence?

Mr. HARRIS. Yes.

Mr. YATES. Does the fact that Oklahoma projects only five inspectors to make their inspections make you suspicious as to whether or not they will comply with the regulations?

Mr. HARRIS. No, sir. I will judge that on their performance, not on suspicions.

Mr. YATES. Suppose they had one inspector, would your answer be the same?

Mr. HARRIS. My staff would certainly not have approved the program with one inspector.

Mr. YATES. Why do they approve it with five then?

Mr. HARRIS. Apparently they, through their calculations, felt that five could handle the job.

Mr. **Yates**. Suppose your inspectors decide Oklahoma isn't handling the job adequately. In that instance, you will take primacy away from Oklahoma?

Mr. **Harris**. We will ask them first to raise the number of inspectors to make it an adequate force to carry out the enforcement. If they don't, then we will.

Mr. **Yates**. How much time will you give Oklahoma?

Mr. **Harris**. It depends upon whether they are making an honest effort to increase their staff.

Mr. **Yates**. Well, what determines an honest effort? If they have five inspectors in February 1982, and five projected for 1983, a year later, that would indicate they are not about to take any steps to provide reasonable inspection, wouldn't it?

Mr. **Harris**. I do not know that we have asked them to raise that number.

Mr. **Yates**. I see. Then is the fault yours in not asking them to raise that number? You think five may be adequate?

Mr. **Harris**. Five inspectors may be adequate.

Mr. **Yates**. For 3,264 annual inspections?

Mr. **Harris**. That is 600 inspections a year. There is a possibility, yes, sir.

Mr. **Yates**. Can each inspector do that many?

Mr. **Harris**. In Kentucky they came close to that level.

### WITHDRAWING STATE PRIMACY

Mr. **Yates**. What happens if your inspectors decide that any State has not met the regulations and that primacy should be withdrawn? How do you go about establishing that fact? You have indicated you would give them the chance to remedy the situation, which I think is reasonable. Suppose that situation is not corrected, and primacy is withdrawn. Do you have an adequate force of inspectors on a Federal level to make the necessary inspections?

Mr. **Harris**. We would not have an adequate force if it were one of the larger mining States from which the primacy was withdrawn. But we would certainly hire additional inspectors and put them into that State. I don't anticipate this happening on any wide basis.

Mr. **Yates**. Are there any States whose inspections you have found not to be adequate?

Mr. **Harris**. We are only now entering into our oversight role with the permanent program. And it is really too early to judge that at this time. Our June 15th report should give us some indication on the interim situation, and then on a regular basis, on the annual date of the approval of those programs, we should have a very reliable report on the performance of each of the States.

### LITIGATION

Mr. **Yates**. Are there any States with approved or conditionally approved programs that have lawsuits pending?

Mr. **Harris**. Lawsuits against the programs?

Mr. **Yates**. Yes.

Mr. **Harris**. Yes, sir, there are two States with pending lawsuits.

Mr. **Yates**. Which States are they?

Mr. HARRIS. Virginia and Alabama that I know of. Alabama's may have been dismissed. There were conversations that led us to believe it probably would be. There was a suit filed against Kentucky's program, and it was withdrawn.

Mr. YATES. Have you seen the Virginia suit?

Mr. HARRIS. Yes, sir.

Mr. YATES. What about the allegations in the complaint about the failure of the Virginia program to meet certain standards?

Mr. HARRIS. Of course, we are in litigation on that particular program which precludes my making any really definitive statements. But so far as I am concerned the allegations that are made are picayune.

Mr. YATES. Does picayune mean not accurate?

Mr. HARRIS. I think picayune means less than serious, or less than justified.

Mr. YATES. What does the court mean when they say the court entered an order saying although the court has no question about the diligence exercised by the U.S. Attorney the diligence of the Department of the Interior is subject to question.

Why did the court say that in that lawsuit?

Mr. HARRIS. That was a legal question on the filing being 1 or 2 days late, sir.

Mr. YATES. I see. That has all been remedied now?

Mr. HARRIS. Yes, sir.

### OSM REORGANIZATION

Mr. YATES. Let's talk about your reorganization. Did your reduction in force take place on March 5, 1982?

Mr. HARRIS. Yes, it did.

Mr. YATES. How much of a reduction in force was it?

Mr. HARRIS. It was a sizeable reduction in force, but only 10 people throughout our whole organization have been displaced, and I think some of those are still on temporary status, and we may find positions for them.

Mr. YATES. Have any of them taken place in region 3?

Mr. HARRIS. The reorganization?

Mr. YATES. Yes.

Mr. HARRIS. Some of the people from region 3 who were not vital to the approval of the programs in region 3 have been transferred to the Eastern Technical Service Center.

Mr. YATES. What is the status of your reorganization?

Mr. HARRIS. We have completed the reorganization in the West. We have completed the reorganization in Washington headquarters. We have completed the reorganization in region 1. And the reorganization in regions 2 and 3 has been completed on paper, but the people have been detailed to their present positions until the State program approvals are completed.

Mr. YATES. Which State offices are now operational?

Mr. HARRIS. I have the list here, sir.

Mr. YATES. Would you put the list into the record?

Mr. HARRIS. Yes.

[The information follows:]

*Status of Office of Surface Mining State offices*

| | Opening date |
|---|---|
| State office: | |
| Missouri: Iowa, Kansas, Missouri | Operating. |
| New Mexico: California, Colorado, New Mexico, Utah, Hopi, Navajo. | Do. |
| Oklahoma: Arkansas, Louisiana, Oklahoma, Texas | Do. |
| Wyoming: Alaska, Montana, North Dakota, Oregon, Wyoming, Crow. | Do. |
| Alabama: Alabama, Georgia, Mississippi | June 14, 1982. |
| Illinois | June 1, 1982. |
| Indiana | July 29, 1982. |
| Kentucky | Operating. |
| Ohio: Michigan | July 9, 1982. |
| Pennsylvania: Pennsylvania, Rhode Island | August 1, 1982. |
| Tennessee | Do. |
| Virginia | Operating. |
| West Virginia: Maryland, West Virginia | Do. |

Mr. YATES. Has the Eastern Technical Center been established?

Mr. HARRIS. Yes.

Mr. YATES. In Pittsburgh?

Mr. HARRIS. Yes, sir.

ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR REGULATORY CHANGES

Mr. YATES. Let's talk about regulations changes.

When do you expect to complete the Environmental Impact Statement?

Mr. HARRIS. We expect to complete the entire regulatory reform by November 1. We expect to have a draft EIS completed by June 15, and expect to have the final EIS completed by August 15.

Mr. HUNT. The public comment period is closing on August 15.

Mr. YATES. What was the date for public comment?

Mr. HARRIS. The public comment period will close on August 15.

Mr. YATES. Is the commentary period and redrafting likely to spill over to fiscal year 1983?

Mr. HARRIS. Yes, by November first we should have it all completed.

Mr. YATES. Has there been an appropriate budgetary request made to cover any extra expense?

Mr. HARRIS. Yes, sir.

Mr. YATES. Where is that reflected in your budget?

Mr. HARRIS. Mr. Culp.

Mr. CULP. Mr. Chairman, there was not a new budget request. You may recall that we increased the level of effort in the budget last year for the regulations revision function. That increase is in our technical services budget line item which finances this work.

Mr. YATES. So the payment provision is in that particular item?

Mr. CULP. Yes. That is the work on the regulations themselves. The NEPA compliance is in a different subcategory from the technical services activity in the 1983 budget request.

Mr. YATES. Is your EIS being prepared in-house, or by an outside contractor?

Mr. **Harris**. It is being prepared in-house, sir.

### STATE INSPECTORS

Mr. **Yates**. Let's talk about State grants, then. There is an increase of $3,168,000. How many additional inspectors will this increase support? Take a look at justification page OSM-12.

Mr. **Harris**. In answer to your question, sir, the number of State inspectors as a result of the grants in this budget will go from 571 to 740. There will be more inspectors in the field—State and Federal—than there have ever been in the history of the program.

Mr. **Yates**. Mostly State?

Mr. **Harris**. Mostly State inspectors.

Mr. **Yates**. The number of Federal inspectors goes down to 69, though?

Mr. **Harris**. Yes, sir.

Mr. **Yates**. With assists from a bench of 14?

Mr. **Harris**. Yes, sir.

Mr. **Yates**. Where will the 14 be until they are needed?

Mr. **Harris**. They are in the State offices, and they also work in other areas. These 14 people are double trained. They will work half-time on other duties.

Mr. **Yates**. What are they trained as?

Mr. **Harris**. They are trained as inspectors and AML reclamation specialists.

Mr. **Yates**. AML?

Mr. **Harris**. Yes, for the Abandoned Mine Lands program; specifically emergency project management.

### FEDERAL INSPECTOR TRAINING

Mr. **Yates**. How long does it take to train an inspector?

Mr. **Harris**. We have a training program for them. It is a continuing training, really. I have not really been satisfied with the level of training in the past, and we are working now on additional training for inspectors.

Mr. **Yates**. How long does it take to train an inspector?

Mr. **Harris**. I don't have a number on that.

Mr. **Yates**. What does your present program provide?

Mr. **Schmidt**. Most of the present inspectors have already had some training by virtue of the previous experience. We have reorganized so we don't have a current figure on it. The discussions which we have had said that the basic orientation is a matter of a couple of months of training for the inspector.

After that it is a matter of on the job training and developing skills.

Mr. **Yates**. Is there a civil service rating for an inspector, with requirements?

Mr. **Harris**. No, sir.

Mr. **Yates**. There is not. Can you——

Mr. **Griles**. You don't mean a test to be taken, do you sir?

Mr. **Yates**. Yes.

Mr. **Griles**. No, there is no test.

Mr. **Yates**. But it is a civil service job?

Mr. **Harris**. Yes.

Mr. YATES. Does the civil service have any requirements for the job at all by way of background, education or any training at all?

Mr. HARRIS. I do not know that I am aware of, any sir. Most of the people——

Mr. YATES. Do you take anybody off the street and make an inspector out of them?

Mr. HARRIS. Most of the people are degreed, principally in biological science.

Mr. YATES. Is that a requirement?

Mr. HARRIS. That is a requirement, yes, sir.

Mr. YATES. A degree in biological science. So, you have to be a college graduate?

Mr. HARRIS. Yes, sir. These are quality people.

[COMMITTEE NOTE.—Subsequent to the hearings OSM informed the committee that OPM allows certain combinations of general and specialized experience, such as experience as a State inspector, to qualify a person who does not have a degree.]

### FEDERAL INSPECTOR TRAINING

Mr. YATES. You take BS graduates. How do you mold them? How do you train them to be inspectors?

Mr. HARRIS. We have not done a great deal of inspector training because we have been cutting back our inspector force, rather than adding.

Mr. YATES. What did you do last year?

Mr. HARRIS. We didn't hire any last year, either, sir.

Mr. YATES. Do you have any——

Mr. HARRIS. The previous Administration had a training program during the time that they were expanding their forces. In many cases, they hired inspectors who had some previous experience with the States, then set up a full training program with the training officer in the agency. We have not seen the necessity to do that due to the fact that we have cut back, rather than added to our inspection staff.

### STATE INSPECTOR TRAINING

Mr. YATES. Do you have any minimum standards for State inspectors?

Mr. HARRIS. Not for State inspectors. That is left up to the State regulatory authorities.

Mr. YATES. No. minimum standard? Can a State take anybody off the street and name them an inspector?

Mr. HARRIS. I assume that they could, but I doubt that they would.

Mr. YATES. Why do you doubt they would, with the background of some of the States in lack of regulation? In order to get an adequate inspection you would have to have an adequate inspector. How do you know whether the people that the State is hiring are adequate to do the job if there are no minimum standards for inspectors in the State? The fact that a State says that inspection is being done by a State inspector doesn't mean that the inspection is being done adequately, does it.

Mr. **Harris**. Well, I do not think that a college degree is the divider between a person who is capable or isn't capable of being trained to be an inspector.

Mr. **Yates**. I didn't say that. Look at what the law provides, though. Your law provides that before you approve of any State program, you are going to have to find that the State has the legal authority and the qualified personnel necessary.

Mr. **Harris**. We analyze that in the program approval, and in most cases these people have had adequate experience or training.

Mr. **Yates**. How do you know that?

### STATE PRIMACY PROGRAMS

Mr. **Harris**. Our State program approval people look into the States' staff resources.

Mr. **Yates**. Who are your State program approval people?

Mr. **Harris**. Who are they?

Mr. **Yates**. Yes, where are they? How many State program approval people do you have?

Mr. **Harris**. Well, Mr. Art Abbs.

Mr. **Yates**. Is Mr. Art Abbs here?

Mr. **Harris**. And Mr. Schmidt heads that area. Mr. Abbs is one of his senior people there. Would you like to address it?

Mr. **Yates**. Which part of the budget is that in?

Mr. **Harris**. Program operations and inspection.

Mr. **Yates**. All right, that is on page OSM-16. Is this 351 people for 1982?

Mr. **Harris**. Yes.

Mr. **Yates**. Okay.

### STAFFING FOR STATE PRIMACY PROGRAMS

How many people do you have working on that, Mr. Schmidt?

Mr. **Schmidt**. On the State program approval?

Mr. **Yates**. Yes.

Mr. **Griles**. That appears on page 21, Mr. Chairman.

Mr. **Yates**. You have 80 people and you are reducing it to 67, is that right?

Mr. **Harris**. Yes, sir. And by that time, we will have the State programs approved in——

Mr. **Yates**. What is the breakdown of the 80 people? Are they all inspectors?

Mr. **Harris**. No, no. These are our people who are actually looking at the——

Mr. **Yates**. At the program and at the State inspectors?

Mr. **Harris**. Yes.

Mr. **Yates**. To see if they are qualified, is that right?

Mr. **Harris**. That is right.

Mr. **Yates**. All right. Are all 80 engaged in that?

Mr. **Harris**. They are——

Mr. **Yates**. There are no secretaries?

Mr. **Harris**. That is total people, yes.

Mr. **Yates**. I know. How many people are secretaries, how many people are clerks, how many people are engaged in appraising the quality of the State personnel?

Mr. HARRIS. I would like to submit those numbers for the record, sir.

Mr. YATES. Well, I would like you to tell me now or this afternoon when you come in.

Mr. HARRIS. I don't have those numbers available, sir. We can try to answer it this afternoon.

Mr. YATES. All right.

We are going to get a breakdown on who the 80 consist of?

Mr. HARRIS. Yes, sir.

[COMMITTEE NOTE.—The information can be found on page 1226.]

Mr. YATES. All right.

This is an ongoing evaluation process, isn't it?

Mr. HARRIS. Yes, it is.

Mr. YATES. All right then, why are you reducing the number of people?

Mr. HARRIS. Because we will not need the same numbers of people to go through the annual State program review process that we have needed while the States were getting their programs approved. From now on this will be a review process. The initial program approval will be behind us.

So, that is the reason for the number of cuts we have had.

Mr. YATES. How many personnel did you have for the State primacy programs in fiscal year 1982?

Mr. HARRIS. How many did we have for the State primacy programs?

Mr. YATES. You have 80 listed as the fiscal year 1983 base level. How many did you have for fiscal year 1982?

Mr. HARRIS. It is a difficult figure to give because part of them were working in the regions where the——

Mr. YATES. You have 80 in 1983, what is the comparable figure for 1982?

Mr. HARRIS. I would assume from those figures that there were about 13 that we won't need in fiscal year 1983 because of the change in our function in the State primacy area.

### COMPARISON OF STAFFING WITH 1982 BUDGET JUSTIFICATION

Mr. YATES. Can the figure that is in the justification which appears in the hearings for fiscal year 1982 part 2, page 112 be correct? It shows the comparable figure as being 47, rather than 80?

Mr. HARRIS. In the State primacy area?

Mr. YATES. Yes, for State primacy programs it shows 45 people. How do you suddenly get 80?

Mr. HARRIS. I can't answer that question, sir. I don't go back that far with the program. I am not familiar with the numbers we had then.

Mr. YATES. Well, this is comparable to page OSM-21 in your 1983 justifications. Something is drastically wrong.

Mr. HARRIS. Mr. Chairman, I think Mr. Culp could straighten this out.

Mr. YATES. Okay, Mr. Culp, straighten it up.

Mr. CULP. I can try.

One of the problems is that there is a difference in the measures. The table in the 1983 budget is total full-time equivalents. I believe in the 1982 budget you may be looking at the number that said there were 47 full-time permanent positions.

Mr. **Yates**. Yes, it is full-time permanents. Is there that much of a difference between 45 full-time permanents and 80 FTE's?

Mr. **Culp**. I would——

Mr. **Yates**. Mr. Gorrell didn't indicate that there would be that much of a difference when we discussed this the other day.

Mr. **Culp**. No, sir, I would agree there would not be that big a difference.

Mr. **Yates**. Also, it is kind of interesting when you look at Federal lands programs. The 1983 base is 11. The 1982 justification shows 98 full-time positions for the 1982 estimate.

Mr. **Culp**. There is a change in the budget where the Federal lands component last year included all of the mine plan review and NEPA compliance work which, in the 1983 budget, we transferred to the technical services activity.

So, you have a part of the function that was there in 1982 which isn't there in 1983. It is now in a different activity.

Mr. **Yates**. Ordinarily we can trace your personnel from one year to the other; we are having trouble here.

Mr. **Culp**. One of the things we did when we reorganized was to take a look at how our positions broke down by these functions. There were some changes attributable to a new analysis of where the people were spending their time. In the small operator assistance area there is another adjustment which is due to the fact that the laboratory certification process that shows up in this category in the 1982 budget moved into technical services in the fiscal year 1983 request. This is another activity one that has not been eliminated but just moved.

Mr. **Harris**. We have made a very serious attempt to have our budgets more nearly reflect the actual activities of people on board than they had in the past. That is one of the reasons for the changes.

Mr. **Yates**. I don't understand that. Your 1982 justification had 47 full-time personnel in your State primacy programs. I assume you don't have a breakdown of the 47 in this budget? Why don't we have a breakdown of personnel? I think this is a critical program for this operation to determine whether or not the States are complying with the requirements of law.

Well, maybe we can find out a little bit by looking at page OSM-23, which indicates you are losing 56 people. You are losing reclamation specialists, Federal program specialists, mining specialists, management specialists, clerk-typists. But we are having some trouble because it is very difficult to compare the FTP's with the FTE's, isn't it? But we still ought to know and expect you to provide for the committee the number of people that are going to work for the Federal Government in appraising the quality of the State inspectors. You are going to give us that?

Mr. **Harris**. Yes, sir.

[The information follows:]

## JOB FUNCTIONS—STATE PRIMARY

| | Professional | Clerical |
|---|---|---|
| Headquarters: | | |
| Grant administration | 5 | 2 |
| Small operator assistance | 3 | 2 |
| State program review/evaluation | 15 | 5 |
| Indian lands program | 2 | 1 |
| State offices: | | |
| Grant administration | 8 | 3 |
| Small operator assistance | 0 | 0 |
| State program review/evaluation | 21 | 8 |
| Indian lands program | 4 | 1 |
| Total | 58 | 22 |

### UTAH COOPERATIVE AGREEMENTS

Mr. **Yates**. You have got a cooperative agreement with Utah covering the period between January 21 and July 31. Why do you announce that on March 3 and make it retroactive to January 21?

Mr. **Harris**. Well, in the case of many of these cooperative agreements, if they can't be processed rapidly enough to meet a particular date, the States incur ongoing expenses in running their programs and in doing the work that is provided under the cooperative agreement. It is not uncommon that we will catch up payment to them for work done previously with a cooperative agreement dated at a later date than when they started on that particular work. It won't happen in the future unless it is uncontrollable.

But, in this particular case it was a situation in which work had been completed, and the State had every reason to be repaid for that work.

Mr. **Yates**. Can you tell me why it had every reason to be repaid for the work?

Mr. **Harris**. It was work they were doing under agreement with OSM. The paperwork on our part was just not processed fast enough to get the payment to them when the work started. It was for Federal lands work. In every cooperative agreement where Federal lands are involved, we do reimburse the States for their work in that area.

Mr. **Yates**. All right. What is the ratio of Federal mine lands to non-Federal mine lands in Utah?

Mr. **Harris**. I don't have that.

Mr. **Yates**. Would you provide that for the record?

Mr. **Harris**. Yes, sir.

[The information follows:]

### Ratio of Federal Mine Lands to Non-Federal Mine Lands in Utah

At this time for mines covered by the cooperative agreement, we do not have the data indicating how many acres are Federal lands and how many acres are non-Federal (private, State or Indian). However, out of 29 total inspectable units in Utah 18 (62.1 percent) are considered to be partially or completely on Federal lands.

## FUNDING FOR COOPERATIVE AGREEMENTS

Mr. **Yates**. Apparently you are going to have a uniform policy respecting regulation costs for all the States. Is my interpretation of your justification correct?

Mr. **Harris**. I am not sure of your question, sir.

Mr. **Yates**. Well, page OSM-14, in the last paragraph, after discussing what you have encountered in your negotiations with the States you say: "This has resulted in inequities as different amounts have been awarded to various States for similar work. OSM is now finalizing a policy that will result in all States addressing this matter in a similar way. The policy is expected to be based on whether or not the Federal Government would carry out specific discrete functions on non-Federal intermingled lands if it was the Regulatory Authority."

I assume you intend to have a uniform system of costs?

Mr. **Harris**. Yes, sir, and we anticipate that system will go into effect about May of this year.

Mr. **Yates**. Of this year, you mean currently?

Mr. **Harris**. Yes, this month, sir.

Mr. **Yates**. All States are going to be treated equally as far as the costs are concerned?

Mr. **Harris**. On their work on Federal lands, yes, sir.

Mr. **Yates**. In connection with cooperative agreements?

Mr. **Harris**. Yes, and with——

Mr. **Yates**. All right.

Mr. **Harris**. And any other type contract work.

Mr. **Yates**. Would you provide the committee with a copy of the policy?

Mr. **Harris**. Yes, sir.

[The information follows:]

### Cooperative Agreement Policy

A copy of the final document will be submitted to the Committee after it has been approved by the Director.

Mr. **Yates**. Did you have a policy you followed in fiscal year 1982?

Mr. **Harris**. No, we didn't have. It was handled on a State-by-State basis, with no uniformity.

Mr. **Yates**. Do you know the ratio of Federal mine lands to State mine lands for the States where you expect to enter into cooperative agreements, or where you already have?

Mr. **Harris**. I don't have those figures available.

Mr. **Yates**. I know, but you will place them in the record?

Mr. **Harris**. Yes, we can submit them for the record.

[The information follows:]

### Ratio of Federal Mine Lands to State Mine Lands for States With Cooperative Agreements

At this time for mines covered by cooperative agreements for Federal lands, we do not have the data indicating now many acres are Federal lands and how many acres are State lands. The following information indicates the number of mines partially or completely on Federal lands in States with cooperative agreements or anticipated to have cooperative agreements.

| State | Total inspectable units[1] | Mines on Federal lands |
|---|---|---|
| Alabama | 1,052 | 3 |
| Colorado | 80 | 33 |
| Montana | 12 | [2] 13 |
| New Mexico | 10 | 4 |
| North Dakota | 11 | 6 |
| Utah | 29 | 18 |
| West Virginia | 3,409 | 1 |
| Wyoming | 31 | 23 |

[1] A mine site may be comprised of more than one inspectable unit.
[2] In Montana, the Rosebud Mine has 5 separate permitted mines and the Decker Mine has 3 separate permitted mines.

### KENTUCKY REGULATORY PROGRAM COSTS

Mr. **Yates**. All right. There is kind of an anomalous situation with respect to Kentucky apparently and we wondered why. You have a statement on page 12 saying, "the total cost to operate a State regulatory program is projected to increase as States take over primacy thereby increasing their workload particularly in repermitting existing mines." Yet Kentucky's costs are estimated to go down from $14 million to $13 million.

Can you tell us why?

Mr. **Harris**. The costs in fiscal year 1982—the $14 million—reflect startup costs, equipment costs. These are one-time occurrences and will not be an annual expenditure.

Mr. **Yates**. Isn't that true of the other States, as well?

Mr. **Harris**. Well, it is more true in Kentucky. Due to the number of mines that they have and the terrain there, especially in eastern Kentucky, they had very heavy investments in radio equipment, four wheel drive vehicles and that type of equipment that probably is heavier than in any other State.

Mr. **Yates**. How long do you estimate it will take Kentucky to complete its repermitting?

Mr. **Harris**. We have put them on a schedule of 20 months.

Mr. **Yates**. Well, would the fact that the figures show that Kentucky received $18 million in regulatory grants for fiscal year 1981, which were cumulative, indicate that Kentucky may have had its initial startup costs before 1982.

Mr. **Harris**. Well, they probably have been covered more than 1 year. Certainly, they didn't do all of their purchases in fiscal year 1982. I am sure that some of them went back to fiscal year 1981. But since they have now received primacy and they were gearing up for it during those previous years, I think that the decreased budget figure for 1983 is certainly justified.

### INSPECTION SAMPLING

Mr. **Yates**. Let's talk about program operations and inspections again. You are pretty well convinced the 17 percent sampling is adequate?

Mr. **Harris**. Well, sir, I think we have to rely on some figure until it's proven wrong, because there isn't any way to justify a complete duplication of State inspections by Federal inspectors. I think that wasn't anticipated by the act and regulations.

We have what we think is a good statistical study that has been done. We intend to carry out our oversight in that manner, and evaluate its effectiveness. And if it is not adequate, we will change it. If it is adequate, we will stay with that program.

Mr. **Yates**. In which States are you going to resort to the 17 percent sampling program? Obviously, you intend to do it in Kentucky because of the numbers; right?

Mr. **Harris**. We will do it in all the States on a nationwide basis. All the States that have primacy will fall into this program. The computer first tells us what number of mines out of that size population we have to inspect to get 95 percent confidence in our sample of inspections.

We are in the process now of breaking down the types of mines in each State. When we ask the computer for a random sample, it will be giving us a random sample over the complete stratification of mines so that what we are inspecting is representative.

And I think in every approach to this we are taking the best scientific and mathematical information available to us and utilizing it in this sampling type of oversight inspection.

Mr. **Yates**. Would the sampling strategy be more effective if it was based on various types of facilities rather than on total State program?

Mr. **Harris**. That is the reason we are doing the stratification at this time, sir, so we wouldn't be inspecting all large mines, all medium sized mines, or all small mines, but getting a true random sampling.

Mr. **Yates**. Will you be doing 17 percent of your estimated annual inspections, totaling 4,800?

Mr. **Harris**. I still don't understand the question, sir.

Mr. **Yates**. You are projecting required annual inspections totaling 4,800. Will you be doing 17 percent of those?

Mr. **Harris**. We will be doing 4,844 inspections.

Mr. **Yates**. Okay, 4,800 inspections represents 17 percent of the total inspections that you will be called on to make?

Mr. **Harris**. Well, 3,157 actually represents the 17 percent. Then we have seven Indian mines to inspect, which will take 84 inspections. We have Federal programs in Georgia and Washington that will require 180 inspections. We believe that our followup inspections, the second phase, will be about 1,148, and citizens complaints, about 275, making a total of 4,844 inspections.

Mr. **Yates**. Let's put that chart in the record.

[The chart referred to follows:]

Mr. YATES. Of the 4,800, how many will be oversight inspections?

Mr. HARRIS. 3,157 will be the initial oversight inspections.

### STATES WITH PRIMACY

Mr. YATES. Does that mean primacy will have been given to all the States?

Mr. HARRIS. No, sir.

Mr. YATES. Then you wouldn't be doing oversight inspections for the States that haven't received primacy.

Mr. HARRIS. No, and that is the reason that I have the 180 inspections set aside for Federal programs in Georgia and Washington.

Mr. YATES. That is for Georgia and Washington.

Mr. HARRIS. Yes, sir.

Mr. YATES. Okay. What about Ohio and, what is the other one, Indiana.

Mr. HARRIS. We expect that Ohio, Indiana, Pennsylvania, and Tennessee will have their programs approved by about the 1st of July. Then they too will be in the position where we will provide oversight inspections. These inspections will be included among the 3,157.

Mr. YATES. What is holding up their approval at this time?

Mr. HARRIS. It is in the normal course of approval. Some State had to be last. We have moved four of the programs through since the beginning of this year. And we have four still to go, all of which are well toward approval at this point.

### INSPECTIONS OF INACTIVE MINES

Mr. YATES. Do you have any policy for inspecting mines that are no longer active?

Mr. HARRIS. Yes. Under present regulations, they have to be inspected much as the other mines are inspected.

Mr. YATES. Is that your chart that you were referring to a few moments ago?

Mr. HARRIS. Yes, we are revising that provision in our regulations. A while ago you—someone—objected to my anticipating regulatory changes, but we do anticipate these. We will not require the number of inspections of inactive sites that we have had before.

Mr. YATES. Why is that?

Mr. HARRIS. Well, unless there is activity at an inactive site, the situation is not going to change. If we have reason to believe that the situation has changed or activity has started again, then we will go back in and inspect those on a regular basis. But it would seem to me that continued inspection of nonactive sites is a waste of our inspector's time.

Mr. YATES. Well, we read from the Energy Daily of May 13, it says that Mr. Rogers of Consolidation Coal says when we close our mines, in many cases water pollution doesn't stop. In many cases it gets worse than it ever was when the mine was in operation. Doesn't your answer assume that when a mine is closed, the water pollution has already existed and will not come in at some time in the future?

| State | Inspectable Units (I.U.) | Indian Lands Mines | Sampling Insp. | Indian Mines Insp. | Federal Program Insp. | Second Phase Assist. | Citizen Compl. | Total Insp. |
|---|---|---|---|---|---|---|---|---|
| Maryland | 135 | | 100 | | | 8 | 1 | 109 |
| Pennsylvania | 3854 | | 349 | | | 236 | 74 | 659 |
| Virginia | 1294 | | 296 | | | 79 | 10 | 385 |
| W. Virginia | 3409 | | 345 | | | 209 | 13 | 567 |
| Alabama | 1052 | | 282 | | | 65 | 15 | 362 |
| Georgia | 12 | | | | 144 | | 1 | 145 |
| Kentucky | 5638 | | 360 | | | 347 | 97 | 804 |
| Tennessee | 882 | | 268 | | | 54 | 22 | 344 |
| Illinois | 308 | | 171 | | | 19 | 2 | 192 |
| Indiana | 360 | | 186 | | | 22 | 10 | 218 |
| Ohio | 1048 | | 281 | | | 64 | 9 | 354 |
| Arkansas | 93 | | 75 | | | 6 | 1 | 82 |
| Iowa | 19 | | 18 | | | 1 | 1 | 20 |
| Kansas | 76 | | 64 | | | 5 | 1 | 70 |
| Missouri | 68 | | 37 | | | 4 | 1 | 42 |
| Oklahoma | 272 | | 160 | | | 17 | 6 | 183 |
| Texas | 14 | | 14 | | | 1 | 1 | 16 |
| Alaska | 1 | | 1 | | | 0 | 1 | 2 |
| Arizona | | 2 | 0 | 24 | | 0 | 1 | 25 |
| Montana | 11 | 1 | 11 | 12 | | 1 | 1 | 25 |
| New Mexico | 6 | 4 | 6 | 48 | | 0 | 1 | 55 |
| N. Dakota | 11 | | 11 | | | 1 | 1 | 13 |
| Oregon | 1 | | 1 | | | 0 | 1 | 2 |
| Utah | 29 | | 27 | | | 2 | 1 | 30 |
| Washington | 3 | | | | 36 | 0 | 1 | 37 |
| Wyoming | 30 | | 28 | | | 2 | 1 | 31 |
| Colorado | 80 | | 66 | | | 5 | 1 | 72 |
| Totals | 18,706 | 7 | 3,157 | 84 | 180 | 1,148 | 275 | 4,844 |
| Grand Total | 18,713 | | | | | | | |

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Shouldn't you be checking periodically to see what the condition of the mine is in later years?

Mr. **Harris**. If we are adequately doing our job with surface mining reclamation, we are not going to have that acid water problem because our reclamation is going to be concurrent with the mining. And if the mining is inactive, reclamation is going to be current right up to the time that it stopped its activity.

What they are referring to in the article, I believe, is underground mines and not surface mines, where after closure you often develop acid mine drainage problems.

Mr. **Yates**. What problems are you likely to have with surface mining that become inactive?

Mr. **Harris**. Oh, if surface mines become inactive, and you anticipate reactivation of them at some time in the future, you might very well have an acid water problem—confined to a pit that they might leave open—if it doesn't have adequate fill-up to get enough water over the coal to eliminate the generation of acid water.

But you might have some siltation problems and some runoff problems if their sedimentation ponds build up, or something of that sort. But that is not something you have to look at with the frequency that you do an active mine.

Mr. **Yates**. Do you have to worry about subsidence?

Mr. **Harris**. Not from surface mining, no. And in the case of the mines that are inactive, due to having been mined out, then the only thing you have to observe is their revegetation to see whether or not they are actually getting proper growth. That again does not require the frequency of inspection that an active mine requires.

Mr. **Yates**. Are you going to include State programs where only conditional approval is granted for purposes of evaluation?

Mr. **Harris**. Yes.

### MINES ON INDIAN LANDS

Mr. **Yates**. Do you have any policy for oversight on Indian mines?

Mr. **Harris**. Since none of the tribes thus far have had approval, their operations I assume would continue under the interim program until they do have approval. When they meet the Federal requirements and submit Federal mine plans then Federal permits are issued.

Mr. **Yates**. There is no such thing as primacy with those mines?

Mr. **Harris**. There probably will be in the future, yes, sir.

Mr. **Yates**. Does the statute provide for primacy of Indian mines?

Mr. **Harris**. Yes, Section 710 requires the Secretary to report to the Congress on the question of Indian regulatory authority over surface mining on Indian lands. OSM is now preparing a report for the Secretary on this issue.

### EVALUATION OF COOPERATIVE AGREEMENTS

Mr. **Yates**. How do you require evaluation of Federal lands in conjunction with cooperative agreements with States when you are evaluating the States' programs? You have cooperative agreements with the States to oversee Federal lands. Is evaluation of Federal lands performed in conjunction with evaluation of that State's program?

Mr. Harris. Yes, it is.

Mr. Yates. In connection with evaluating State programs, do you obtain opinions from individuals, citizens groups and industry groups? How do you go about doing that?

Mr. Harris. We have a public comment period before the approval of all the State programs.

Mr. Yates. Do you have a standard of inspection frequency you expect the States to follow?

Mr. Harris. It is in the act, sir. We expect them to adhere to the provisions of the act.

Mr. Yates. All right.

Mr. Harris. I probably should have said that the States have a public comment period on their regulations and State program before submitting them.

## TEXAS PROGRAM EVALUATION

Mr. Yates. Let's talk about Texas. You had 21 aerial surveys, or inspections in Texas. Why so many? I thought you weren't doing aerial inspections yet.

Mr. Harris. Those are oversight inspections in Texas, sir. Those are very large lignite mines down there that are very inspectable in that manner.

Mr. Yates. By the air?

Mr. Harris. Yes.

## PUBLIC CONCERNS IN MONTANA

Mr. Yates. Has OSM made any response to the concerns expressed by the public in Montana?

Mr. Harris. On what subject, sir?

Mr. Yates. On the question of accumulative effects of mining on the hydrology of certain areas.

Mr. Harris. Oh, yes. There was a lands unsuitable petition for Montana up on the Tongue River that we took action on probably 3 or 4 months ago. It involved coal mining in the Tongue River area and also along an area adjacent to and feeding into the Tongue River called Otter Creek. Certain allegations were made that these areas were unsuitable for mining.

In conjunction with the State of Wyoming we did extensive hydrologic studies and made computer models of what effects future mining would have. We came to the decision that in the Powder River area, it could not be shown that mining would have an adverse effect on the hydrologic balance.

However, the Otter Creek area, which is quite different, is an intermittent stream. It is a very saline area. We determined that a 1 year hydrologic study, such as we had the time to make, was not sufficient to determine what future hydrologic problems with mining might be there. We made the requirement that anyone attempting to work a mine in that area would have to do up to 3 years of hydrologic studies in order to convince OSM that there would not be serious hydrologic impacts in the Otter Creek area.

I thought it was a very good decision. I don't think we have had any repercussions on it. I think most of the people involved felt that it was a reasonable decision.

### RAGLAND, W.VA. WATER PROBLEMS

Mr. **Yates**. Let's talk about Ragland, West Virginia and its water problems.

Mr. **Harris**. Yes, sir.

Mr. **Yates**. Are representatives of a city or a town allowed to accompany State inspectors on a tour of the mine, or mines?

Mr. **Harris**. As citizen complainants, yes.

Mr. **Yates**. Well, apparently they were refused, weren't they?

Mr. **Harris**. No, I think the people who were refused the walk around were attorneys from Washington who wanted to walk around with the citizen complainants there. And I don't think the act or the regulations provide that counsel automatically can accompany these people.

Mr. Schmidt knows that case better than I and might like to fill me in on it.

Mr. **Yates**. All right, Mr. Schmidt; would you fill him in?

Mr. **Schmidt**. Do you want me to go back to the same question?

Mr. **Yates**. Yes, the same question. The Energy Daily reports that St. Clair filed a citizens complaint. He had to work on a particular day set for inspection and he sent five representatives: his wife; Ella Jane Moore, who lives in Ragland; Ken Mills, an anti-coal activist from nearby Williamstown, West Virginia; former inspector from OSM, Don Steck; and a young lawyer from the Citizens Mining Project in Washington. The President of Highland Creek's Eastern Kentucky Division apparently objected to it.

He refused to allow them to accompany the State inspectors, arguing that only bona fide Raglanders could go on the inspection.

Mr. **Schmidt**. I think the point Mr. Harris made is that the act speaks to the person making the complaint having a right. I think that is where the confusion arose. The State made a call about who was a duly authorized representative and chose to exclude three of the people. They allowed two to go.

Mr. **Yates**. Does OSM have any responsibility to follow up the State inspection since it was initiated by a citizen complaint?

Mr. **Schmidt**. Yes, sir. I think the basic concern is with regard to the polyacrylamides. OSM had been following that since 1979. We had done water quality monitoring. We have never found the acrylamides, which are the toxic materials, in the Ragland water supply. We have also arranged——

Mr. **Yates**. Would you normally find it in connection with your inspections?

Mr. **Schmidt**. No, these are water quality samples taken looking for acrylamide.

Mr. **Yates**. I see. Do you do that?

Mr. **Schmidt**. No, we had it done by contractors, a qualified commercial testing facility. They found no acrylamide in the water. Since West Virginia is one of the States that has primacy, we have arranged for the EPA to work with the State Department of Natural Resources and Department of Health to provide additional water quality monitoring.

Again, they have never found acrylamide in the water supply.

Mr. HARRIS. I have been in touch with Mr. David Callahan, who is the Head of the Department of Natural Resources there. And from that level, we are following up on it, too. I think one thing that should be noted here is that polyacrylamides have been detected in that water.

Mr. YATES. They have been?

Mr. HARRIS. Yes.

Mr. YATES. Why didn't your contractor find it, then?

Mr. HARRIS. That is what I am trying to explain. Polyacrylamides have not been classified as toxic substances.

Mr. YATES. I see.

Mr. HARRIS. Acrylamides have been classified as toxic substances. But we have found no trace of acrylamides in that water. Neither has anybody else, to my knowledge.

Mr. YATES. Aren't polyacrylamides acrylamides?

Mr. HARRIS. No.

Mr. SCHMIDT. Two different substances.

Mr. HARRIS. That is the thing that is confusing a lot of people in this issue, I think, even to the point that West Virginia put out a warning to the people using the water saying they should not use it because polyacrylamides are a toxic substance.

EPA has not found polyacrylamides to be toxic.

Mr. YATES. I am sure that 5 years from now they will find them to be toxic.

Mr. HARRIS. We are watching the situation very closely.

Mr. YATES. Let's come back at 1:30.

## AFTERNOON SESSION

Mr. YATES. Mr. Reporter, show the hearing as coming to order.

### JUDICIAL AND ADMINISTRATIVE PROCEEDINGS

What is the workload associated with the provision of expert witnesses to help the Secretary in lawsuits relating to surface mining control?

Mr. HARRIS. We estimate 8 man years for 1983.

Mr. YATES. How do you arrive at that estimate?

Mr. HARRIS. It is based on past experience in that area.

Mr. YATES. What does that mean? How many lawsuits have you had?

Mr. HARRIS. We have about 135 to 140 cases a year up to now. We are a much sued Agency.

Mr. YATES. Well, I can understand why.

What is the nature of the expert witness testimony?

Mr. HARRIS. They are principally technical people who have experience in areas such as hydrology, mining engineering, various environmental pursuits.

Mr. YATES. How much money do you spend on them?

Mr. HARRIS. About $390,000 a year.

Mr. YATES. For 8 hours work?

Mr. HARRIS. No, that is 8 man years.

### TECHNICAL TRAINING

Mr. YATES. Eight staff years.

You are eliminating technical training under technical support? This was budgeted at $432,000 in the present fiscal year.

Mr. HARRIS. A good part of it, sir, was a training program for the certification of blasters on a nationwide basis. We have changed that program to the point that the blasters will be certified by the several States, rather than by the Federal Government. And that is one of the reasons for that change.

[COMMITTEE NOTE: Subsequent to the hearing OSM informed the committee that technical training was not eliminated. Part of the function is in the $1.5 million for technical advice and assistance. A separate organization for it was eliminated.]

### TECHNICAL SUPPORT FOR STATE EVALUATIONS

Mr. YATES. How many State program evaluations will you complete in fiscal year 1982?

Mr. HARRIS. In 1982?

Mr. YATES. Yes.

Mr. HARRIS. My best estimate for fiscal year 1982 would be, I believe, eight.

[COMMITTEE NOTE: Subsequent to the hearing, OSM provided a revised estimate of 16.]

Mr. YATES. How about 1983?

Mr. HARRIS. There should not be any in fiscal year 1983. Do you mean oversight, or approval, sir?

Mr. YATES. State program evaluations for technical support.

Mr. HARRIS. Oh, evaluations. There will be one for each of the States that has an approved program.

Mr. YATES. I see. That makes 50?

Mr. HARRIS. Twenty-four, I believe, sir.

Mr. YATES. Twenty-four?

Mr. HARRIS. Yes, in 1983.

### GRANTS FOR MINE PLAN REVIEWS

Mr. YATES. How much of the increase in State regulatory grants is for mine plan review?

Mr. HARRIS. I think Mr. Culp can probably find that faster than I can.

Mr. YATES. All right.

Mr. CULP. $2 million, Mr. Chairman, in 1983. That is part of the $4 million for cooperative agreements.

Mr. YATES. You might expand on that for the record. Indicate how much in total is for mine plan review, both State and Federal activities and how it changes for 1983.

[The information follows:]

#### BUDGET FOR MINE PLAN REVIEWS

The $2 million in the regulatory program grants for mine plan review work on Federal lands by the State regulatory authorities is not an increase over the amount planned in fiscal year 1982. It is the total amount requested for that function and compares to a current estimate of $2.4 million from the fiscal year 1982 appropriation. Mine plan review work performed directly by Federal employees is in the technical services subactivity and the fiscal year 1983 request of $4.35 million is a decrease of $3.17 million from fiscal year 1982. The decreases in both the State and Federal components are attributable to a reduction in the projected workload and a reduction in costs based on fiscal year 1981-1982 experience. The workload changes include 18 fewer mine plans to be worked on during the year (95 compared to 113 in fiscal year 1982); 4 fewer environmental impact statements (9 compared to 13 in fiscal year 1982); 12 fewer mine modifications to existing mine plans (100 compared to 112 in fiscal year 1982); and a reduction in the level of required OSM support for BLM leasing activities.

Mr. YATES. Do the States have authority to do mine plan reviews for Federal lands?

Mr. HARRIS. Through the cooperative agreement arrangement, yes.

### TECHNICAL STUDIES

Mr. YATES. I see.

You want $1 million for technical studies and applied research. How useful is the study to complete an inventory of coal processing and loading facilities?

Mr. HARRIS. I think it will be very useful. It gives us good background information on those inspectable facilities that are included among that type of facility. I think one of the probably weaker points in the information we have put together so far is indicated by the wide range of inspectable facilities that you come up with when you ask the States, IRS, or MSHA about their estimates of inspectable facilities. The figures are not consistent. I think better inventories in those areas would be most helpful.

Mr. YATES. Does the $65,000 you want for fugitive dust control relate to the work being done in the same area by the Bureau of Mines?

Mr. HARRIS. No, this is not the same area, sir. This is at the mine site for surface mines. I think most of the studies being done by Bureau of Mines have to do with underground mines.

[Additional information follows:]

### FUGITIVE DUST CONTROL STUDY

The $65,000 requested by OSM for fugitive dust control work is a continuation of a joint study with the Environmental Protection Agency to develop emission factors for fugitive dust sources from surface mine operations. The initial study centered around western mines and this next phase will result in determining emission factors for the same kind of operations under the differing environmental conditions of eastern mines. Emission factors are numbers which allow the calculation of air pollution quantities from different sources.

Fugitive Dust Control Research being conducted by the Bureau of Mines is directed toward the control of fugitive emissions, primarily from haul roads, and does not duplicate this study for quantitatively estimating emissions.

Mr. YATES. What is OSM doing to try to beef up environmental research programs?

Mr. HARRIS. We have a number of programs here. Wildlife habitat management, aquatic habitat management, prime farmland productivity, determination of hydrologic consequences of mining—in these which our program affects—we believe research is justified in the budget.

Mr. YATES. Are you hurt at all by the fact that budgets for environmental research programs are begin cut in the budgets of other agencies?

Mr. **Harris**. Well, I think there are two things that will take up the slack. One is that in some situations we are approving environmental practices to be carried out by the mine operators. Also, we have taken a lot of care to concentrate on those particular projects concerning the environment that are associated with OSM's area rather than trying to treat the whole spectrum.

### REGULATORY AND ISSUES MANAGEMENT

Mr. **Yates**. Let's talk about general administration. What is the purpose of the regulatory and issues management activities that has been established in your office?

Mr. **Harris**. Well, this small group has been more than worth its cost. They keep track of the location within the Bureau of all of the important correspondence and issue documents. In a matter of minutes, unlike when I first came to the Bureau, we can put our hands on just about any document, determine who has held it up and why. Some of the other people in the Congress who are concerned a great deal with coal have been very complimentary of our ability to get them immediate responses to their letters. This group has been more than worthwhile.

### UNAPPROPRIATED BALANCE FOR AML

Mr. **Yates**. Let's talk about abandoned mine reclamation. If the amount requested for fiscal year 1983 is appropriated, and the receipts come in as projected, can you tell us what the unappropriated balance in the fund will be?

Mr. **Harris**. The State portion will be about $367 million by the end of fiscal year 1983.

Mr. **Yates**. Yes.

Mr. **Harris**. There are additional funds in the Secretary's discretionary fund.

Mr. **Culp**. There will be $265 million in the discretionary side of the fund, Mr. Chairman.

Mr. **Yates**. Why was $87 million in prior years appropriations carried forward into fiscal year 1982?

Mr. **Harris**. Well, most of the States did not have the approved title IV program which would entitle them to get State reclamation funds. The act makes it clear that until they get their title V programs approved, the State reclamation programs, they are not eligible to draw down title IV funds.

Mr. **Yates**. Can anything be done to speed up the reclamation work?

Mr. **Harris**. We are moving toward that now. We are approving title IV programs, in many cases, concurrently with the title V approval. Last week, for instance, we were able to approve Alabama's title V program and title IV program, and hand to them, that day, a grant check in the amount of $3.9 million for the first installment on their AML funds. That has never been done before, so we are trying to expedite it.

## TRANSFER OF BOM RECLAMATION

Mr. **Yates**. What is the basis for the annual savings of $1.5 million in this consolidation? You announced it in a February 22 press release.

Mr. **Harris**. That is the consolidation of the different types of delivery mechanisms?

Mr. **Yates**. Yes.

Mr. **Harris**. What we feel is necessary to make the program work better is to have the States as a focal point for AML activities. After an extensive study on delivery systems, it was our opinion that was the States would be most efficient and best suited to take the lead in the administration of AML programs. By combining the two and giving the bulk of the monies to the State grants, we were able to effect that savings.

Mr. **Yates**. Is this decrease reflected in your fiscal year 1983 budget?

Mr. **Harris**. Yes, I believe it is, isn't it? Yes, it is.

Mr. **Yates**. Where would it be reflected?

Mr. **Harris**. I was mistaken on what programs you were referring to. This is the moving of the function of the Bureau of Mines, which was a duplicate of our AML function, to the Office of Surface Mining. They have had $16 million of AML funds appropriated to them for 2 years in a row. By moving this funding into OSM, we can effect these savings. But we transferred from Bureau of Mines all those personnel who were in this program. We have had no cutbacks in personnel at this point. Many of these people will be assimilated into our other programs in the future. These savings are in Agency overhead.

Mr. **Yates**. What is the status of the $16 million that was appropriated to the Bureau of Mines for abandoned mine reclamation work?

Mr. **Harris**. Well, there is $25 million remaining of the $32 million that had been appropriated over the 2 years. That is in contrast with OSM's having spent every thing that was appropriated for Interior reclamation projects. This is one of the reasons that we determined in the delivery study that this function could be better administered by OSM.

Mr. **Yates**. What is the status of it?

Mr. **Harris**. It has now been reverted to OSM, and we are in the process of setting up programs to allocate it.

Mr. **Yates**. When will your allocation program be completed?

Mr. **Harris**. It will be starting very shortly. It will probably take us 18 months to 2 years to draw down completely on that fund.

## APPROVED AML PROGRAMS

Mr. **Yates**. How many States have now approved abandoned mine reclamation programs?

Mr. **Harris**. We have 12 approved thus far, sir.

## RECLAMATION GRANTS

Mr. **Yates**. Do you still think States will be able to accomplish as much reclamation work as you indicate in the budget?

Mr. HARRIS. Yes, I think so. The $78.5 million request is a figure that comes from our having contacted the States to determine what they thought their levels of funding should be. In some cases where we knew their requests were more than they could efficiently handle in that given year, we made deductions. If our legitimate utilization should run over that $78.5 million, the Secretary and I both have made the statement, and will follow up on it, that we would come back for an additional appropriation to take care of any shortfall.

Mr. YATES. All right.

A press release of February 18 stated you were giving $7.6 million to Virginia for abandoned coal mine lands reclamation. What is the ratio of administrative expenses to actual construction work in the Virginia plan?

Mr. HARRIS. We don't have it here.

Mr. YATES. Would you put it in the record.

[The information follows:]

### ADMINISTRATIVE COSTS AND CONSTRUCTION COSTS FOR VIRGINIA'S RECLAMATION GRANT

| | Amount | Percent |
|---|---|---|
| Administration | $1,740,864 | 23 |
| Projects Costs | 5,948,141 | 77 |
| Other | | |
| Total | 7,689,005 | 100 |

Mr. YATES. At what stage of development is a reclamation project before a grant is awarded, as you did to Virginia?

Mr. HARRIS. All the planning on that program has to be approved by OSM. The State submits their AML plan. Our people review it, check it for accuracy and determine whether or not it will accomplish what it should. If our staff can agree with the suppositions made in that grant request, then it is approved.

Mr. YATES. Do you think you will be able to obligate all the money available in fiscal year 1983?

Mr. HARRIS. Obligate the $78.5 million?

Mr. YATES. Well, you have a projected unobligated balance of $45,767,000 at the end of fiscal year 1982. Are you going to be able to obligate all that in fiscal year 1983?

Mr. HARRIS. The States believe that they can, yes. Usually, the question is, Am I requesting enough in that particular fund?

Mr. YATES. Are you?

Mr. HARRIS. I think I am. I think we are right on target.

### ANNUAL PROJECT PLAN AWARDS

Mr. YATES. Let's take a look at OSM-56. Now you have an annual project plan award table. Why the variation? Why so great a variation between the States? For example, West Virginia is to receive $1,397,635. Kentucky at the same time is to receive $123,230.

Mr. HARRIS. These are cooperative agreements to pay them for work they carry out on behalf of OSM to develop their first project programs.

Mr. YATES. Why do you have almost ten times as much in West Virginia as in Kentucky?

Mr. HARRIS. The Virginia program and West Virginia program were approved very early. And the Kentucky program just received approval recently. The State there has not geared up to the point to use the quantities of money that you see with Virginia and West Virginia. They have more planning to do.

Of course, as big producing States, Virginia and West Virginia do have large allocations. Kentucky, with a little time in the program, will undoubtedly arise to a figure in excess of that.

Mr. YATES. Do you want to check that answer, and if you think you should expand on it, will you do so for the record?

Mr. HARRIS. We will, sir, yes.

[The information follows:]

### ANNUAL PROJECT PLAN AWARDS

West Virginia's award is $1,397,635 and Kentucky's award has been amended to $712,367. Kentucky requested an increase to $481,561 (from the original $123,231) on October 9, 1981, and another increase to $712,367 on February 18, 1982.

Funding for preparation of the first annual submission of projects between Kentucky and West Virginia varied because West Virginia estimated they would assess 40 projects at an average cost of $20,000 each and Kentucky estimated they would assess 24 projects at an average cost of $3,000 each. The difference in average cost per project is that West Virginia needs to do more detailed assessments than Kentucky. In compiling their portion of the National Inventory, Kentucky gleaned advance information so that they are far along in the preparation of their first annual submission.

### AML COOPERATIVE AGREEMENTS

Mr. YATES. Your budget justification on page 78 says that almost $50 million has gone to the States through cooperative agreements. Will you place in the record a statement as to when the awards were made?

Mr. HARRIS. Yes, sir.

[The information follows:]

Mr. YATES. What progress have the States made in obligating these amounts? Are they doing well?

Mr. HARRIS. Yes. The cooperative agreements have turned out to be a very productive arrangement, especially with the States in the West.

Mr. YATES. Could the States use this money to contract with local soil and conservation districts?

Mr. HARRIS. Yes, they can.

Mr. YATES. You are going to evaluate plans and procedures for the evaluation of the States' permanent programs. Don't give us much detail.

Mr. HARRIS. Mr. Chairman, on my previous answer I would like to further explain my statement.

Mr. YATES. All right.

Mr. HARRIS. At this very moment, the States would not be able to contract with the Soil Conservation Service. However, we are in the rulemaking process on a rule that will allow them to do just that.

Mr. YATES. All right.

Mr. HARRIS. Those rules are now at OMB.

Mr. YATES. When do you anticipate that will happen?

Mr. HARRIS. Probably within a month.

### OVERSIGHT FOR RECLAMATION PROGRAMS

Mr. YATES. Let's go back to my other question. The plans and procedures for the evaluation of the States' permanent programs does not give much detail on your oversight of the State reclamation programs. What percentage of State projects will you review?

Mr. HARRIS. Mr. Culp, would you respond to that.

Mr. YATES. Are you going to use a sampling strategy again?

Mr. CULP. Well, Mr. Chairman, we would review all of the projects as a part of reviewing the AML program and grant application from the State. The act requires us to approve it on a project-by-project basis.

Mr. YATES. You are going to look at all of them, and not use——

Mr. CULP. The on-the-ground look would be on a sampling basis similar to the inspections.

Mr. YATES. That is before the work is done, isn't it?

Mr. CULP. The review part is, right.

Mr. YATES. What happens after the State does the work, will you also inspect them at that point?

Mr. CULP. We will inspect them. We will not inspect every project.

Mr. YATES. How many will you inspect?

Mr. CULP. It will be a sampling process, again.

Mr. YATES. Seventeen percent?

Mr. CULP. Well, we have about 90 people in the budget who are involved with this aspect of the program. It would be a sizeable percentage, which I can't give you at this moment. But considerably larger than the 17.

Mr. YATES. Well, I would like to get an answer to that. Do you want to put it in the record as to what you propose to do?

Mr. CULP. Yes, sir.

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## COOPERATIVE AGREEMENTS
## AWARDED BY STATE BY FISCAL YEAR

| States | 1979 Cooperative Agreement Obligated | 1979 Expended | 1980 Cooperative Agreement Obligated | 1980 Expended | 1981 Cooperative Agreement Obligated | 1981 Expended | 1982 to Date (4/15/82) Cooperative Agreement Obligated | 1982 to Date (4/15/82) Expended | Balance to be Expended |
|---|---|---|---|---|---|---|---|---|---|
| Alabama | 424,758 | ---- | 312,149 | 375,194 | ----- | 135,892 | 281,255 | 18.356 | 488,720 |
| California | ---- | ---- | ---- | ---- | 31,858 | 31,858 | 113,000 | ---- | 113,000 |
| Colorado | 69,834 | ---- | ---- | ---- | ----- | 69,834 | ---- | ---- | -0- |
| Illinois | 259,329 | 69,259 | 1,626,488 | 404,404 | ----- | 931,320 | 1,153,103 | 34,088 | 1,599,849 |
| Indiana | ---- | ---- | ---- | ---- | ----- | ---- | 130,744 | ---- | 130,744 |
| Kentucky | 1,427,361 | 669,467 | 8,628,197 | 574,977 | ----- | 522,030 | 594,802 | 326,368 | 8,557,518 |
| Maryland | 1,000,445 | 917,658 | 119,262 | 95,923 | ----- | 106,126 | ---- | ---- | -0- |
| Missouri | ---- | ---- | 4,218,000 | 3,674 | ----- | 411,130 | ---- | ---- | 3,803,196 |
| Montana | ---- | ---- | 437,889 | 37,000 | ----- | 145,728 | ---- | 60,490 | 194,671 |
| New Mexico | 19,136 | ---- | 265,178 | 19,136 | ----- | 263,507 | ---- | 1,671 | -0- |
| North Dakota | 235,750 | ---- | 657,567 | 217,000 | ----- | 498,336 | ---- | ---- | 177,981 |
| Ohio | 491,168 | 81,948 | 3,270,340 | 693,118 | ----- | 2,091,883 | 757,641 | 213,024 | 1,439,176 |
| Oklahoma | 28,024 | ---- | 118,000 | 28,024 | ----- | 45,005 | ---- | 1,391 | 71,604 |
| Pennsylvania | 3,340,860 | 91,730 | 7,317,080 | 206,599 | 1,254,129 | 1,351.779 | ---- | 100.712 | 10,161,249 |
| Rhode Island | ---- | ---- | ---- | ---- | ---- | ---- | 83,000 | ---- | 83,000 |
| Tennessee | 153,560 | 70,000 | 157.470 | 79,699 | 103,174 | 173,599 | ---- | ---- | 90,906 |
| Texas | ---- | ---- | 758.960 | 78,535 | ---- | 74.543 | ---- | ---- | 605,882 |
| Virginia | 1,371,077 | ---- | 2,836,344 | 1,205,013 | 77,631 | 799,870 | 1,165.615 | 464,871 | 2,980,913 |
| West Virginia | 2,021,319 | 136,000 | 2,879,106 | 160,000 | ---- | 991,748 | ---- | ---- | 3,612,677 |
| Wyoming | ---- | ---- | 142,035 | 32,000 | ---- | 32,839 | ---- | ---- | 77,196 |
| TOTALS | 10,842,621 | 2,036,062 | 33,744,065 | 4,210,296 | 1,466,792 | 8,677,027 | 4,279,160 | 1,220,971 | 34,188,282 |

Mr. **Yates**. How often will you determine if a State is complying with reclamation grant conditions? How often are you taking a look at it?

Mr. **Culp**. Well, the going out would be a continuous kind of monitoring process with the AML program specialists that we have in our State offices. We will also get semiannual reports from the States on their grants, and have an annual evaluation of the total program in each State.

Mr. **Yates**. How many people do you have working on the program?

Mr. **Culp**. Approximately 90 people.

[COMMITTEE NOTE: Subsequent to the hearing, OSM informed the committee that the number of people is 60 rather than 90.]

Mr. **Yates**. How many sites will they inspect?

Mr. **Culp**. That is the figure I will have to provide for the record.

[The information follows:]

### STATE RECLAMATION OVERSIGHT POLICY

The Office of Surface Mining (OSM) will monitor a State's activities, procedures, and reclamation progress for compliance of approved abandoned mined lands (AML) programs.

Specifically OSM will monitor the following areas of an approved State AML program:

(1) Compliance with State's reclamation program; (2) Annual submissions of projects; (3) Reclamation in accordance with grant agreements; (4) Public involvement; and, (5) Administrative and management structure.

On-site evaluations of randomly selected samples of AML projects by their nature do not have the same general utility for AML program oversight as sample inspections in the course of a regulatory program. In the AML program, individual project complexity and the range of project types are the most significant considerations in determining which projects should be reviewed "on the ground" to determine that reclamation objectives are being met. Sampling strategies are only advisable, warranted, and cost effective where there are numerous relatively uncomplex projects of a single type (a group of similar shaft sealing projects is an example). On the other hand, OSM commonly expects situations where a State's annual program may consist entirely of a few technically complex and/or multi-million dollar projects where both progress and final on-site reviews by OSM are appropriate.

An initial draft of an AML oversight procedures manual is currently under review and contains both complexity and type guidelines as well as minimum percentages. For example, the current draft proposes a minimum review criterion of 3 projects per State or 5 percent of a State's projects, whichever is greater. This would result in an "on the ground" review of approximately 20 percent of the total AML projects each year. A final draft is expected to be completed by September 30 and a copy will be furnished to the committee.

### AML INVENTORY

Mr. **Yates**. Let's talk about reclamation fund management. How is the inventory of abandoned mine land used to manage the reclamation fund?

Mr. **Harris**. I am sorry, sir.

Mr. **Yates**. You have used over $12 million on the national abandoned mine land inventory. How is the inventory used to manage the reclamation fund?

Mr. **Harris**. Each State did an OSM-financed abandoned mines inventory which has all been put in a computer. We can draw on that information at any time. It gives us a tremendous amount of information to determine the total number of abandoned land mine projects and, in many cases, the priorities of those projects. It is very close to completion. At this time, I think there is one more year's allocation to do some fine tuning on the project.

Mr. **Yates**. What is involved in maintaining the inventory?

Mr. **Harris**. Mr. Schmidt is very familiar with this program. If I may, I would let him give you some specifics on it.

Mr. **Schmidt**. The maintenance, Mr. Chairman, is basically a matter of any additional information that relates to new sites which are added to the inventory, plus the changing status on existing sites. They could change from priority one to priority two by virtue of some kind of action taken during the past year.

### UNCOLLECTED RECLAMATION FEES

Mr. **Yates**. In your justification, page 63, you have said that past due uncollected reclamation fees total $18 million. How much of that is collectable?

Mr. **Harris**. We just set up a new program of collections to determine that. We don't know how much of it is collectable, but we are setting out to collect as much as possible. We have brought the collection rate up to in excess of 98 percent of the fees owed to OSM, which is the best collection rate of any Agency in Government now. But, we would still like to have that other 2 percent.

Mr. **Yates**. How do you go after the 2 percent?

Mr. **Harris**. We have set up a program to identify, with the assistance of MSHA, the IRS, and some other agencies, who is reporting to them who is not reporting to us. We will be the first Agency in Government I believe to use an outside collection agency to collect corporate debt to the Government.

Our solicitors are becoming very active in taking these cases to court and getting us legal action, on collections as quickly as possible. We have reason to believe from earlier results that this is going to be a successful program.

Mr. **Yates**. Does the $18 million uncollected fees represent the 2 percent?

Mr. **Harris**. Yes, sir.

Mr. **Yates**. Are the States cooperating with you in collecting this amount of money?

Mr. **Harris**. We have spent some time with the States, but we really haven't called upon them all that much. We feel this is a Federal function.

### DEBT COLLECTION EFFORT

Mr. **Yates**. You do have outside attorneys or collection agencies trying to collect the money?

Mr. **Harris**. We are working on a contract at this time, sir. We have the funding for it for 1982.

Mr. **Yates**. How come the Department of Justice doesn't collect it for you?

Mr. **Harris**. They have such a backlog over there and these are not priority cases with them.

Mr. **Yates**. I suspect there aren't many that are.

Is there any precedent for using outside collection agencies?

Mr. HARRIS. None that I know of. But we felt that it could be done at a lesser cost by an outside agency than by using our own people.

Mr. YATES. Really? How much are you going to pay them?

Mr. HARRIS. We have $500,000 available for 1982.

Mr. YATES. It will cost $500,000 to collect $18 million, Mr. Culp?

Mr. CULP. Mr. Chairman, the typical way you pay for the service is a percentage of what——

Mr. YATES. That is what I thought, but what percentage are you going to pay?

Mr. CULP. We don't have the offers in yet. But the standard commercial percentage is about 15 percent. We hope we can get it for somewhat lower than that.

Mr. YATES. Is it 15 percent if you have to go to trial?

Mr. CULP. It is 15 percent of what the collection agency gets for you.

Mr. YATES. Will the collection agency incur, or be willing to assume the costs of going to court?

Mr. HARRIS. They will not go to trial for us. If they are unsuccessful, and then we decide to go to court, it will come back to the Federal judicial system to do that.

Mr. YATES. Why is that? Why are you willing to use outside collection agencies and not willing to use outside attorneys? If Justice doesn't think much of the cases now, what makes you think they will think more of them if they have to go to court? I would think they would think less of them.

Mr. GRILES. Mr. Chairman, we work very closely with the Justice Department and U.S. attorneys in the district in which most of these cases are. They are working with us to get these cases on the dockets when we do file them. The first effort, however, is to try to get the maximum amount of return, and that is to use the collection agency. Once it is determined that we cannot collect we work with the Justice Department.

Mr. YATES. How many outside agencies are you using?

Mr. GRILES. We have a proposed contract right now.

Mr. YATES. How are you going to select the contractor? I would think lots of lawyers would be looking for the opportunity to help you collect $18 million.

Mr. CULP. We had a bidder's conference the other day. I saw the figures, I believe there were 25 different firms that showed up.

Mr. YATES. I would guess some firms would be willing to take less than 15 percent, wouldn't you?

Mr. CULP. That is what we are hoping. Our debts are a little larger than the normal debt in the commercial collection business, so the percentage should be lower.

## INTERIOR RECLAMATION PROJECTS

Mr. YATES. Let's talk about Interior reclamation projects. What is your estimate of the unfunded, high-priority, nonemergency projects on Federal lands and in States without approved Federal programs? You say that fiscal year 1983, it is unlikely you will undertake any new high priority nonemergency projects. How many are there?

Mr. **Harris**. We are attempting to direct that portion to the States with the approved AML programs. For that reason, we will be working on those projects that cause imminent danger because of our ability to rapidly alleviate the danger. We will leave the rest of that type of AML projects to the States as much as possible.

### CENTRALIA

Mr. **Yates**. How much of a priority is the Centralia Mine?

Mr. **Harris**. Centralia Mine fire has been determined not to be an imminent danger project. We purchased about $1 million worth of homes there, I think 27 homes. We relocated the people in the area there might be imminent danger.

So far as the rest of the fire is concerned, it is certainly a bad situation for all involved, but not one that is considered to be an imminent danger.

Mr. **Yates**. The committee made available $850,000. How much of that money have you used?

Mr. **Harris**. Well, we have now a cooperative agreement with the State of Pennsylvania. We have a program that we have planned for the drilling project that the Congress mandated. We anticipate that the contract for that will be let by about the middle of July. We should probably complete the program within 6 or 7 months.

Mr. **Yates**. With whom will the contract be, the State?

Mr. **Harris**. The State will be letting the contract through a cooperative agreement we have with them. We have been working very closely with the State of Pennsylvania on this project.

In addition, there is money available to Pennsylvania through that cooperative agreement for them to analyze the data that are recovered from the drilling project and to monitor the drill holes after the drilling is completed.

Mr. **Yates**. Is there any hope of extinguishing the fire?

Mr. **Harris**. I think the fire could be extinguished, yes. That is just my opinion.

Mr. **Yates**. I know that. But what is it based on?

Mr. **Harris**. Well, I think that there are two things you have to do to put out a fire. One is cut off its oxygen supply; another is to drop the temperature of whatever the burning substance is to below its kindling point. Those two things are all you need.

The use of chemicals to seal off the openings to the surface which are actually providing oxygen to the fire may extinguish it after a period of time.

Mr. **Yates**. Then why enter into the contract with the State of Pennsylvania? Why don't you just put out the fire?

Mr. **Harris**. This is what the Congress mandated. We gave the Congress two plans; one of which was to approach it by attempting to cut off the oxygen and to extinguish the fire. The other was to continue the study through the drill hole method. The message we got back was that this is what they wanted to do.

Mr. **Yates**. That is silly, then, isn't it? If you can put out the fire, why go through the rigamarole of going through the drilling process?

Mr. **Harris**. I think their concern was that we might just be able to slow the fire down rather then extinguish it, which is certainly a possibility. There is no guarantee.

Mr. **Yates**. Have they tried any methods that you have in mind yet to put the fire out?

Mr. **Harris**. No. They have tried some methods of pumping slurries and fly ash and such things as that in an effort to isolate portions of the fire.

Mr. **Yates**. Yes?

Mr. **Harris**. Those barriers have been bridged in most cases, and the fire continues to burn.

Mr. **Yates**. How would you vary that? I would certainly favor putting the fire out if you can do it, rather than having a drilling program, wouldn't you?

Mr. **Harris**. I think it should be pointed out that the drilling program is intended to give better data on the fire.

Mr. **Yates**. That's right. That is the purpose of it.

Mr. **Harris**. That is certainly justified, I believe. And the data we now have as a result of drilling done in the past are obsolete, because as the fire advances, your previous data really don't mean anything at that point. We will be collecting fresh data.

Mr. **Yates**. Do you need fresh data to put the fire out?

Mr. **Harris**. Part of it. I haven't told you I can put the fire out, sir. I have only said this is my personal opinion.

Mr. **Yates**. I know. What happens after they are through drilling? Are you then going to go in and put the fire out?

Mr. **Harris**. The State of Pennsylvania will have available about $40 million through their AML funding. It is our hope that——

Mr. **Yates**. They will use that money.

Mr. **Harris**. Taking the data that is collected from this drilling program, that then they can take a very intelligent approach to putting the fire out.

### HIGH PRIORITY PROJECTS

Mr. **Yates**. How much that you appropriated in previous years for high priority projects will you carry into fiscal year 1983?

Mr. **Harris**. Mr. Culp, do you have a figure on that?

Mr. **Yates**. Do you want to put that in the record, Mr. Culp?

Mr. **Culp**. Yes.

[The information follows:]

#### Carryover of High Priority Interior Reclamation Projects Into Fiscal Year 1983

Funds appropriated in prior years for nonemergency reclamation projects, exclusive of funds passed through to the Bureau of Mines, are expected to be totally obligated in fiscal year 1982. Of approximately $12M unobligated by the Bureau on the date of transfer to OSM, approximately $5M will carry into Fiscal Year 1983.

### EMERGENCY PROJECTS

Mr. **Yates**. What is the basis of the estimate of $9.4 million for emergency projects in fiscal year 1983?

Mr. **Culp**. It is based, Mr. Chairman, on our own experience with those type of projects in the last several years.

Mr. **Yates**. Based on your experience in 1981 and 1982?

Mr. Culp. Yes.

### ALBRIGHT AVENUE PROJECT

Mr. Yates. When are you going to begin work on the subsidence stabilization in the Albright Avenue area of Scranton?

Mr. Harris. January 29, 1982, the bids were opened. It was let to C & S Contracting in the amount of $2.2 million. The flushing phase will occur in the fall of 1982 and the project completion should be in the winter of 1984.

### RURAL ABANDONED MINE PROGRAM (RAMP)

Mr. Yates. All right, let's talk about RAMP. You want $3,650,000 to service 244 existing contracts and no new starts. If no money for new starts is provided, how are you going to address the problems?

Mr. Harris. Well, RAMP is one of four delivery mechanisms that has been used. And it does not have the same priority arrangement that the others do.

Since the amounts of money that are going to be collected in this program between now and 1992 will not come close to repairing all the damage that was done by mining prior to 1977, it is my belief that we should use the monies available on high priority projects.

As I stated earlier, I think that there should be one Agency that makes a determination on the priority of those projects, and through which the projects are coordinated. My personal belief and the belief of my senior staff at OSM is that the best delivery method is through the State itself.

If they want to continue in the RAMP program beyond the monies we have funded here, their State program people could very well contract with their soil conservation people and carry out the RAMP-type programs at a great deal lesser cost.

Mr. Yates. What portion of the appropriations remains at the Soil Conservation Service headquarters in Washington?

Mr. Harris. We would like to submit that for the record.

Mr. Yates. Will you also submit what services are provided by SCS?

Mr. Harris. Yes.

[The information follows:]

BREAKOUT OF RAMP POSITIONS AND SALARY COSTS

| | Fiscal year 1982 | | Fiscal year 1983 | |
|---|---|---|---|---|
| | FTE's | Cost | FTE's | Cost |
| Headquarters | 6 | $205,600 | 5 | $171,700 |
| Field | 108 | 2,697,400 | 78 | 1,962,300 |
| Totals | 114 | 2,903,000 | 83 | 2,134,000 |

The Soil Conservation Service draws on several Washington Office positions for administration and technical support of the Rural Abandoned Mine Program. However, no one position is assigned full time to the RAMP program as all positions also provide services to other programs administered by SCS.

### SERVICES PROVIDED

Services provided by these positions include (1) program administration and direction consisting of program development, program management and reporting, contract administration procedures, budget formulation, fund accounting, program evaluation and monitoring, and program coordination with the Office of Surface Mining; (2) technical support activities consisting of development, implementation and evaluation of engineering and vegetative reclamation standards and specifications.

Mr. YATES. You said you would rather see the States do the work on that. What funds in your 1983 budget are requested that will carry out the approach that you suggest?

Mr. HARRIS. A portion of the $78.5 million could be used in that area. There is no particular specific request in the budget, however, for RAMP programs funded through the States.

Mr. YATES. Would you want the State reclamation grant funds to be used to contract with the State RAMP committees?

Mr. HARRIS. Yes, but it would be from the Federal share in this case, sir.

### SMALL OPERATORS 'ASSISTANCE PROGRAM (SOAP)

Mr. YATES. I see. Small operators assistance program. What is the SOAP unobligated balance you are going to carry over into fiscal year 1983, do you know that?

Mr. HARRIS. Mr. Culp, do you have that?

Mr. CULP. We have $18 million unobligated now, Mr. Chairman, and would estimate that a substantial portion of that, perhaps $15 million, would carry into 1983.

Mr. YATES. Why so much? Why is so little used in this program?

Mr. CULP. The reason is that the demand doesn't occur until the State programs are approved and the small operators have to apply for a new permit. With all the States coming on line this year, the demand will increase in fiscal year 1983.

Mr. YATES. On funds that have lapsed, why do you show no obligations for the State regulatory program grants for fiscal year 1981?

Mr. CULP. That is an accounting system problem where the grant reports from the States are not getting into our books. And we have to tie the budget into our books.

Mr. YATES. Are you taking steps to do that?

Mr. CULP. We are.

Mr. YATES. When will you finish that?

Mr. CULP. We just recently assumed responsibility for our own accounting operations, and that will be one of the things we correct by the end of this year.

### CLOSING REMARKS

Mr. YATES. We have a number of questions that we want to ask for the record. Mr. McDade and Mr. Murtha will have some questions, too.

Mr. YATES. Are the funds that you have requested adequate to carry out your programs?

Mr. HARRIS. Yes, we believe that they are.

Mr. YATES. They are?

Mr. HARRIS. Yes.

Mr. YATES. You don't need any more?

Mr. HARRIS. No, sir. If we need any in the AML area, that is a fund that is large enough and the amounts will be great enough that I would feel justified to come back and ask for more.

Mr. YATES. What about the money for inspectors?

Mr. HARRIS. I think that we have adequate numbers of inspectors.

Mr. YATES. Thank you very much, Mr. Harris.

Thank you, gentlemen.

Mr. HARRIS. Thank you.

Mr. YATES. Thank you.

[The questions and answers follow:]

## ADDITIONAL COMMITTEE QUESTIONS

### State Program Status

Question: The Fiscal Year 1983 budget is based on the assumption that all States which desire primacy will have attained primacy during Fiscal Year 1982. Please provide the Committee with an update on the progress of the States in achieving primacy. The answer should include the names of the States, when you now expect them to achieve primacy and the major hurdles to primacy for each.

Answer: All States that have submitted State programs for approval of the Secretary have been granted primacy for regulating surface coal mining, with the exception of four States - Tennessee, Indiana, Ohio and Pennsylvania. The Secretary expects to make final decisions on the programs for these four States by July 4, 1982. OSM has met with the regulatory authority in each State to discuss the unresolved issues relating to the State's program. As a result of these meetings, Tennessee, Indiana, Ohio and Pennsylvania have all submitted additional material to address concerns raised by the OSM review process. Following the close of the public comment period for each program the Secretary will review the OSM's recommendations, all comments received on the program and other relevant material before making the final decision. At present we are not aware of any obstacles that would preclude granting approval to each of the four programs under review.

One other State, Alaska, is expected to submit a State program around July 1, 1982 to attain primacy.

Question: Are there any States which have not formally resubmitted their proposed State program?

Answer: All of the eight States which were prevented from resubmitting by court injunctions have now formally resubmitted their regulatory programs.

Question: Would you expect these State approvals to be conditional?

Answer: Yes, based on the review of State materials to date, OSM would recommend conditional approval for each of the four states whose programs are still under review.

Question: Approximately 13 of the 20 states with primacy have conditions on this primacy. Please give the Committee some examples of the conditions on the State programs.

Answer: Some examples of conditions are the lack of adequate program provisions in the following areas:

1. Provide protection to State employees in performing their duties.

2. Require proof of payment of all reclamation fees prior to permit approval.

3. Provide for time limitations placed on conducting adjudicatory hearings on civil penalties.

4. Identify criteria for temporary relief during administrative review.

Question: Provide for the record the conditions on each State's program. How successful have States been in correcting the flaws in the State programs which led to conditions being attached?

Answer: A summary of conditions and removal status follows:

STATUS OF CONDITIONS FOR STATE PROGRAMS

| State | Original No. of Conditions | No. of Conditions Removed | Material to Satisfy Conditions Under Review |
|---|---|---|---|
| Alabama | 13 | - | - |
| Arkansas | 4 | 4 | - |
| Colorado | 45 | - | 45 |
| Illinois | 5 | - | - |
| Iowa | 3 | 2 | - |
| Kansas | 6 | 6 | - |
| Kentucky | 12 | - | - |
| Maryland | 34 | 34 | - |
| Missouri | 3 | 2 | - |
| Montana | 6 | 6 | - |
| New Mexico | 12 | 3 | - |
| North Dakota | 13 | - | - |
| Oklahoma | 4 | - | 1 |
| Utah | 12 | - | 10 |
| Virginia | 19 | - | 2 |
| West Virginia | 35 | - | - |
| Wyoming | 7 | 4 | - |
| Total | 233 | 61 | 58 |

Question: Over what period of time do the States normally have to correct their programs to bring them up to the standards?

Answer: The Secretary considers three factors in deciding whether to conditionally approve a program. The first factor is whether the State is willing to make a good faith effort to make the necessary changes. Second, no part of the program can be incomplete. That is, the State must be able to operate the basic components of the program, e.g., the permit system and the performance standards. Third, the deficiencies must be minor.

The time period varies with each State. The dates by which States are required to satisfy conditions are established in consultation with the State based on the time required for changes to be adopted under State administrative procedures or legislative schedules. The initial time periods have ranged from 2 to 23 months.

Question: What is OSM's responsibility in relation to monitoring those program elements that are not yet approved? While conditions are still on permanent State programs, would it not be appropriate to have vigorous oversight inspections?

Answer: When the Secretary conditionally approves a State's program, the State must agree to the alternative proposed by the Secretary for disputed portions of the program. Such alternatives could range from the State agreeing not to use authority under its statute to agreeing to enforce comparable federal regulations. We review compliance with these agreements during oversight. Where it has been deemed necessary, OSM has obtained the State's agreement in writing prior to program approval that the State regulatory authority would not implement State program provisions which have been found to be contrary to the federal standards.

The minor nature of conditions and the safeguards OSM has established insure that States do not implement program provisions which fail to meet the federal standards for approval. Since there are no elements of conditions which prevent a State from carrying out mandated inspections and enforcing all the approved provisions of its permanent program, routine OSM oversight inspections and the annual review involved in State program evaluation should make certain that unsatisfied conditions do not hamper implementation of SMCRA.

## Reorganization Costs

Question: Provide for the record the costs of the reorganization from Fiscal Year 1981 and the costs for the first two quarters of Fiscal Year 1982 and the estimated cost for the balance of Fiscal Year 1982.

Answer: $75,000 was expended in Fiscal Year 1981 and $2,063,000 was obligated during the first half of Fiscal Year 1982. We anticipate that $2,910,000 more will be obligated during the remainder of Fiscal Year 1982. Standard accounting procedures will require that a portion of these obligations be deobligated on September 30, 1982 and re-established as Fiscal Year 1983 obligations. The amounts which must be deobligated at the end of the current year are authorized selling and purchase expense allowances for employee residences when the employees involved have not yet sold/purchased their old/new residence.

Question: What is the basis for the estimate of $5.3 million annual savings from the reorganization?

Answer: Salary decreases resulting from personnel reductions account for the major portion of the savings. Concomitant reductions in telephone services and office rent also contribute to the savings. Following is a breakout of anticipated savings from the reorganization:

Projected Annual Savings After Reorganization

| | FY 81 2/ Current Annual Cost | FY 83 Projected Annual Cost | Net Savings |
|---|---|---|---|
| Telephone Services | 468,936 | 245,879 | 223,057 |
| Radio Equipment | 38,268 | -0- | 38,268 |
| Office Rent 1/ | 1,231,045 | 817,795 | 413,250 |
| | 1,738,249 | 1,063,674 | 674,575 |
| Personnel Salary Savings | - | - | 4,667,124 |
| TOTAL | - | - | 5,341,699 |

1/ The decrease in rent payments due to the reorganization is partially offset by an increase of more than 50% in GSA rates.

Standard Level User Charges

| 81 Act. | | Reorg. Savings | | Revised Base | | Rent Increase | | Projected Cost (FY 1983) |
|---|---|---|---|---|---|---|---|---|
| 1,063 | - | 413 | = | 650 | + | 340 | = | 990 |

Regulation Changes

Question: A Washington Post article of April 17, 1982, reported that Secretary Watt agreed to halt proposals to delay 33 strip-mining control regulations until an environmental impact statement has been completed. Why had OSM not originally thought that an environmental impact statement was necessary?

Answer: OSM had never concluded that an EIS was not necessary. Rather, until recently OSM had completed neither its analysis to determine if an EIS was required nor a scoping process to determine what rule revisions had to be included in such an EIS. A premature decision to prepare an EIS could have resulted in the preparation of a superfluous EIS or in the inclusion of extraneous topics in a necessary EIS.

OSM has carefully followed CEQ, Departmental and agency procedures for NEPA compliance in the revision of its permanent program regulations under Title V of SMCRA. Individual environmental assessments (EA's) were prepared by general topic, such as hydrology, as revisions were developed. These EA's were made available to the public in appropriate draft or final form when a proposed or final rule change was published in the Federal Register. A cumulative EA evaluating the environmental effects of all of the revisions was begun in January 1982, when such an analysis of all of the changes became feasible. This cumulative EA, which incorporated and superseded many of the previously prepared individual EA's, was completed May 2, 1982. The proposed finding of no significant impact (FONSI) that accompanied this cumulative EA concluded that four topical areas would not require analysis in an EIS, six portions of the rule changes would have significant impacts to the human environment, and that 29 topics required additional analysis in an EIS to determine if significant impacts would or may occur. A public comment period on the cumulative EA and proposed FONSI closed June 2.

On the basis of the cumulative EA and proposed FONSI, OSM announced that it would prepare an EIS on May 2, 1982. Two scoping meetings were held on May 18 and the scoping process, which began last summer, will be completed shortly in early June.

## State Grants

Question: The amount of money available for State regulatory grants inceases by $3,168,000 in Fiscal Year 1983. How many additional inspectors will this increase support? Provide for the record the current on-board inspection staff by State and what the inspection staff is expected to be in Fiscal Year 1983.

Answer: The following table is based on information supplied by the States.

STATE INSPECTORS *
SURFACE MINING REGULATION

| STATE | FEBRUARY 1982 | FY 1983 PROJECTION |
|---|---|---|
| ALABAMA | 18 | 28 |
| ALASKA | 0 | 3 |
| ARKANSAS | 3 | 3 |
| COLORADO | 13 | 13 |
| ILLINOIS | 14 | 24 |
| INDIANA | 13 | 38 |
| IOWA | 1 | 1 |
| KANSAS | 3 | 3 |
| KENTUCKY | 135 | 156 |
| LOUISIANA | 2 | 2 |
| MARYLAND | 13 | 13 |
| MISSISSIPPI | 0 | 1 |
| MISSOURI | 4 | 4 |
| MONTANA | 16 | 17 |
| NEW MEXICO | 8 | 9 |
| NORTH DAKOTA | 12 | 13 |
| OHIO | 37 | 43 |
| OKLAHOMA | 5 | 5 |
| PENNSYLVANIA | 99 | 180 |

* Authorized to inspect and issue orders.

### STATE INSPECTORS *
### SURFACE MINING REGULATION

| | | |
|---|---|---|
| TENNESSEE | 17 | 26 |
| TEXAS | 10 | 10 |
| UTAH | 6 | 6 |
| VIRGINIA | 48 | 48 |
| WASHINGTON | - | - |
| WEST VIRGINIA | 74 | 74 |
| WYOMING | 20 | 20 |
| TOTAL | 571 | 740 |

* Authorized to inspect and issue orders.

Question: Provide for the record by State a breakdown of the cooperative agreements for Federal lands for both Fiscal Year 1982 and 1983.

Answer: The States shown below have received or are anticipated to receive cooperative agreement financial assistance. The Fiscal Year 1982 total amount is higher than shown on page OSM-12 of the Budget Justifications because it reflects mostly actual rather than estimated figures. In some cases, funds were provided to reimburse work performed in Fiscal Year 1981 that was not applied for previously in a State's grant request. The 1982 increase can be accommodated within the total Fiscal Year 1982 available appropriation for grants and cooperative agreements. The amount for Fiscal Year 1983 is based on the latest estimates from the States (April 1982) as adjusted by OSM to reflect the Federal lands funding policy we anticipate to be in effect in Fiscal Year 1983. Other States may submit requests for cooperative agreement funding at a later time. All Fiscal Year 1983 amounts listed are approximate; after analysis of the States' actual funding requests, further adjustments are expected to reduce total cooperative agreement funding to the $4,000,000 level.

| | FY 1982 | | FY 1983 (funding for 12 months) |
|---|---|---|---|
| Alabama | -- | | $ 37,300 |
| Colorado | $ 600,000 | (15 months) | 450,000 |
| Montana | 360,000 | ( 5 months) | 825,000 |
| New Mexico | 330,000 | (10 months) | 500,000 |
| North Dakota | 115,855 | (12 months) | 110,000 |
| Utah | 1,600,000 | (20 months) | 700,000 |
| Virginia | -- | | 75,000 |
| Wyoming | 2,110,667 | (12 months) | 1,500,000 |
| Total | $5,116,522 | | $4,197,300 |

Question: Since the Federal Government pays the entire amount for cooperative agreements for Federal lands, why does the amount requested decrease between Fiscal Year 1982 and Fiscal Year 1983?

Answer: Prior to April 1982, OSM had not developed a procedure for calculating the Federal cost of processing a mine plan. Also, some cooperative agreements had not taken into account the fact that many mines are located partially on Federal land and partially on State and private lands. A new policy to provide for more equitable distribution of total program costs between cooperative agreements and matching grants is now being finalized. Thus, after taking into consideration OSM actual costs to process an application and relationship of land ownership, OSM's estimated obligation for fiscal year 1983 was reduced to $4,000,000.

Question: What is the Fiscal Year 1982 workload for cooperative agreements/Federal lands? (compare to workload data for Fiscal Year 1983 provided on OSM-13).

Answer: The workload data is as follows:

| | FY 1982 | FY 1983 |
|---|---|---|
| Mine plans received | 99 | 100 |
| Mine plans under review | 97 | 60 |
| Permits issued | 89 | 40 |
| Inspections | 1,280 | 1,560 |

Question: You indicate that you are completing work on a policy that will result in all States addressing Federal lands regulation costs in the same manner. When complete, provide a copy of the policy for the Committee files.

Answer: A copy of the policy for providing uniform cooperative agreement awards to States for regulating mines on Federal lands will be submitted when it is completed.

Question: How did you derive the management initiatives and other adjustments in the calculation of State grant amounts of $13,587,696 in Fiscal Year 1982 and $5,653,832 in Fiscal Year 1983?

Answer: We would be able to save these amounts in Fiscal Years 1982 and 1983 by adjusting grant periods to coincide with the end of the Fiscal Year. We have been reluctant to do so in the past because of the administrative problems and additional paperwork burdens that would result for the States if the Department's appropriation bill was not enacted and signed by October 1.

Savings will also result from close scrutiny of State grant requests. For example, in the past we have found situations where travel needs have been overestimated or where certain planned studies for the lands unsuitable data base have been too large in scope, encompassing more than the likely coal production areas. In addition, we have had cases where a State requested funding for a management information system to assist it in processing permit applications. By suggesting that the State contact another State where we had already funded such a system, substantial savings were realized by modifying the existing system to meet the requirements of the State desiring the system.

Management initiative savings will also occur as a result of changes to the Federal regulations and the individual State programs. The cited example in the Budget Justification (page OSM-12) of the use of aerial reconnaissance to accomplish partial inspection frequency requirements is an illustration. Another example is dropping the requirement from the grant requlations that signed agreements had to be sent to OSM by certified mail. While some of the initiatives involve small amounts individually, taken as a whole the savings can be substantial.

Substantially more dollar savings can be realized in Fiscal Year 1982 than in 1983 because the majority of the management initiatives and adjustments to grant periods are being accomplished in Fiscal Year 1982. The adjustments began in Fiscal Year 1982 for the major coal producing States. For example, Kentucky and Pennsylvania were shortened by two months in 1982 and will be shortened by one more month in 1983. A chart showing grant periods by State is provided for the Committee's use.

Finally, one misunderstanding concerning these savings is that total program costs (page OSM-11) will be reduced. These costs include both the State's share and the OSM grant. To date, every State has provided its share of the total costs and we have no indication that Fiscal Year 1983 will be different. If this were to occur, we would observe it when the State's grant application is reviewed. If there is no evidence that inspections or inspector staffing would be reduced, we will rely upon the annual evaluations of State program to assess the effect and to recommend a change for the future.

## Oversight Policies and Procedures

Question: The level of oversight inspections is based on a sampling strategy which overall calls for inspections of 17% of regulated facilities. What evaluation of the sampling strategy as it has been applied to date have you made?

Answer: OSM's oversight policy involving statistical sampling was implemented in March of this year. We have not accumulated sufficient data in the two months which have elapsed since implementation to evaluate the strategy.

Question: Is the sampling strategy based on the total number of facilities in a State or is the sampling strategy applied to the various types of mining operations within a State? For example, in Kentucky, the Eastern and Western regions are significantly different topographically while in Pennsylvania the Eastern and Western regions are associated with anthracite and bituminous coal, respectively.

Answer: Our initial sampling strategy (95 percent confidence interval) is based on the random sample of all inspectable units within a State. During the initial period of our use of this technique we expect that some of the second phase inspections which we have allowed for in each State will be used to investigate special situations such as anthracite mining.

As we establish patterns and trends, we expect to further modify our statistical strategy. If, for example, experience shows that a State is performing well, we will consider reducing the confidence level slightly with a consequent decrease in the number of necessary inspections. For example, reducing from 95 percent confidence to 90 percent confidence in a State with 1,000 inspectable units would decrease the required number of inspections from 282 to 216. On the other hand, if experience should demonstrate the need to stratify samples, we will do so. We have investigated subdividing Kentucky and Pennsylvania into Eastern and Western sectors. (For Pennsylvania this would correspond to an anthracite and bituminous division.) Should it become desirable to effect this strategy for Kentucky, the result would be 356 sample inspections in the East and 256 in the West. This would represent an increase of 252 inspections over the non-stratified sample. We will advise the Committee should we decide to change our 95 percent confidence and all-State sampling strategy.

Question: Problems associated with mining do not disappear when mining stops. Are inactive mines included in your count of regulated facilities?

Answer: Yes, inactive mines are included in OSM's count of regulated facilities.

Question: An August 5, 1981, GAO letter to Secretary Watt provided comments on OSM's surface mining regulations. One point the letter makes is that greater regulatory flexibility, as OSM is now proposing, "requires better trained inspectors and may involve a greater number of inspectors to ensure compliance. We believe a balance should be maintained between regulatory flexibility and effective monitoring, inspection, and enforcement." How would you respond to these comments made in the GAO letter?

Answer: We do not agree with the GAO statement. OSM has provided greater regulatory flexibility to the regulatory authority, not to the inspector.

Under the new regulations, the regulatory authority will not have to issue the same or similar permits to each operator, but rather will be able to write each permit with conditions designed to deal with actual or potential problems at the particular site. The permit must be written so that it will ensure compliance with the performance standards in the regulations. In essence, some detailed requirements which were formerly imposed through regulations will now be imposed through permits. The inspector will more frequently look to the permit, rather than the regulations, to determine compliance with the applicable program.

We know of no reason why an inspector would need greater training to enforce the applicable program, and no reason why it would take more inspectors to determine compliance.

Part of OSM's oversight program will be to determine whether States are writing enforceable permits which meet the requirements of the Act and OSM's regulations.

## Program in Coal Exploration States

Question: Four States, Oregon, Michigan, Rhode Island and Massachusetts have projected active coal exploration. What workload is there for the program operations and inspection staff in the four States where active coal exploration is projected?

Answer: OSM is the regulatory authority responsible for issuing permits and making inspections in these four States. There are no OSM personnel located full-time in these States. OSM personnel will travel from the OSM offices in Pennsylvania (for Massachusetts and Rhode Island), Ohio (Michigan), and Wyoming (Oregon) and from the Technical Service Centers in Denver and Pittsburgh as needed. At present only Michigan has active exploration work underway although three exploration permits have been filed from Oregon. OSM estimates that about four person-months are currently required annually to carry out the Government's responsibilities in these States.

Question: When do you anticipate that mining will begin in each of those four states?

Answer: There is no coal mining presently taking place in any of these States. It was originally thought that mining would start in the Spring of 1982 but that has been postponed.

## Oversight Policy and Procedures Document

Question: On March 5, 1982, OSM issued "Plans and Procedures for the Evaluation of the States permanent programs". What type of groups were consulted in formulating the "Plans and Procedure for the Evaluation of the States permanent programs"? What State programs have you evaluated under this guidance? What problems have you encountered after evaluation of these programs? Could you provide the Committee with copies of the evaluations of State programs? Of your evaluation staff, how many are in headquarters and how many in state offices?

Answer: Draft "Plans and Procedures" were circulated to the States and key citizen, environmental and industry groups and OSM met with many of the States and groups. All comments received were considered in development of the final "Plans and Procedures".

The policy is currently being implemented and will lead to compilation of evaluation reports. No reports under the new "Plans and Procedures" have yet been completed and no problems have been encountered thus far. Reports were previously completed under interim procedures covering the Texas and Montana programs. Copies have been supplied to the Committee.

OSM will provide the Committee with future evaluation reports. These will be completed as OSM State Office Directors carry out their oversight responsibilities under provisions of "Plans and Procedures".

The annual evaluation is conducted by a team composed of the State Office Director acting as team leader and 4-5 technical personnel selected by the team leader. On the OSM State Primacy program, there are 15 people in Headquarters and 21 in the field who will be involved in evaluating State programs. Depending upon the special needs of the State programs being evaluated, this staff will be assisted by many other OSM people from the Inspection and Enforcement and Technical Support programs. For example, professional engineers would be used in States with large surface mines with major excess spoil disposal sites or agronomists in prime farmland States.

Thus, the origin of team members would be determined by their special expertise as related to the problems which are disclosed by OSM's ongoing State program monitoring efforts.

Question: The evaluation document also states that OSM is to enforce any part of a State program not being enforced by the State. If so, what workload is associated with enforcing those parts of State programs?

Answer: The workload associated with enforcing a part of a State program not being enforced by a State would vary. If, for example, the permitting process of a State program was found to be inadequate, the impact on OSM would be significant in terms of time and staff requirements. On the other hand, if a State's process for designating areas unsuitable for mining are inadequate, the impact would be somewhat less.

Question: The evaluation document lists sources of information OSM will use to monitor a State's performance. What program data are to be furnished by the State for evaluation?

Answer: Program data supplied by the State regulatory agency to the State Office Director at a minimum will include information regarding permits, bond release, bond forfeiture, inspection reports, permit revocations, enforcement actions, results of citizen complaint inspections and results of 10-day notices referred to States, policy memoranda and handbooks.

Also included will be supplemental program data resulting from OSM's quarterly audits of the State's records or as submitted by the State on a quarterly basis. These data would consist of number of authorized inspection personnel, citizen complaints received and cited, assessment conferences, civil penalty collections, informal hearings completed, and violations referred to State courts.

Question: Will you solicit information from individuals, citizen groups and industry?

Answer: Although OSM does not solicit information from these groups, OSM is always receptive to information collected and provided for use in the evaluation of State programs.

Question: Among the items that OSM will monitor is inspection frequency and reporting. What are the standards of inspection reporting?

Answer: The Act requires in Section 517(c) that the regulatory authority file inspection reports adequate to enforce the requirements of and to carry out the terms and purposes of the Act. Standards are not spelled out in the Act for inspection reporting. The phrase "adequate to enforce" is interpreted by OSM to mean that the reports should contain sufficient information concerning the inspection of the site to determine the nature and extent of the inspection and whether the site was in compliance with the requirements of the State's approved program; if not, the conditions causing the violation should be adequately described or noted on the inspection report so that a third party reading the report would know the conditions causing the violations and whether appropriate enforcement action was taken.

In the document "Plans and Procedures for the Evaluation of the States' Permanent Programs," data on inspection frequency and inspection reporting will be obtained as required. A copy of each State inspection report will be provided to OSM weekly or as incorporated in individual OSM/State agreements.

Question: What are the special inspections or case studies that are identified on Page 4 of the "Plans and Procedures for the Evaluation of the States' Permanent Programs?"

Answer: Special inspections or case studies are OSM inspections over and above the basic statistical sample, citizen complaint inspections, and inspections on Federal/Indian lands or in States without primacy. OSM made provisions for these additional inspections in the event that the sampling program conducted in a State identified a problem or deficiency with a portion of the State program. These additional field investigations or inspections may be necessary to further define a problem and the extent of the problem or deficiency.

Question: How are these special inspections or case studies provided for in the Fiscal Year 1983 budget?

Answer: OSM estimates that 1148 of the total of 4844 oversight inspections will be special inspections. Funding for these is included in the $6,100,000 shown on page OSM-22 of the Budget Justification.

Question: Have you initiated any special investigations or case studies?

Answer: OSM has not initiated any special investigations or case studies at this time. The sampling strategy has not been implemented long enough to produce trends.

### Montana and Texas Reviews

Question: The evaluation of both Montana and Texas programs indicate problems with the repermitting process. What are you doing to try to help the States through the repermitting process?

Answer: Montana and Texas as well as all Federal land States are finding that for all existing mines they cannot complete a comprehensive review and issue new permits within the 6 months period following submissions of applications to the States as required by SMCRA. OSM has offered support in the form of manpower, contracts, and computer processing to complete requirements in areas where the States may need assistance. So far only two States have accepted OSM's offer. As explained at the May 18 hearing, OSM is also working with each State to develop a workable timetable for each State to assure that permanent program permits meet the requirements of the approved State program. For example, the schedule for Kentucky has been extended by 20 months.

Question: The evaluation of the Montana State program that you provided to the Committee raises several questions. The report at page nine indicates that Montana mine operators have indicated concern regarding turnover in the State's technical staff. Is this a problem common to all States? What, if anything, can OSM do to try to stabilize State staff? Is turnover also a problem among State inspectors?

Answer: OSM is not aware of significant turnover in technical and inspection staff in State regulatory programs other than as noted for Montana.

Generally, turnover is a problem because of non-competitive compensation levels. OSM can offer assistance to the States in resolving that problem by matching the additional cost for salary increases as allowed under SMCRA. In the past OSM has assisted the States in developing staffing needs and other staffing details.

OSM does not believe that the rate of turnover among State inspectors is a serious problem at this time. Although no survey on the subject has been conducted, this judgment is based on our observations in the course of contacting State personnel.

## Technical Support

Question: Provide for the record the amounts of the extramural studies to be provided by Federal agencies, universities, industry, and the research community.

Answer: The breakdown for extramural studies for Fiscal Year 1983 is estimated to be as follows:

| | $ |
|---|---|
| Federal agencies | 600,000 |
| Universities | 50,000 |
| Research Community | 350,000 |
| | 1,000,000 |

Question: At page OSM-35 of the Justification, there is an increase of $160,000 for technical support for State program evaluations. Please provide the Committee with some examples of the technical support for state program evaluations accomplished in this unit.

Answer: Past activity in this program component has related to the program approval process. Proposed state programs are submitted to OSM to determine compliance with the Act and if they are as effective as the permanent program regulations. Part of the OSM review of these programs deals with the technical aspects of the permitting and performance requirements. In Fiscal Year 1983 emphasis will shift toward assisting the OSM State Offices in annual program evaluations. Recent technical support has been provided with respect to the following issues:

a) The use of a specific level of water to seal acid producing materials in last cut-lakes was reviewed and revealed that four feet of water was deficient to prevent the formulation of acid. OSM technical staff recommended thirty feet of water, but we have agreed to review the matter with the State in the future.

b) EPA provided many technical comments on one state program submission, each of which had to be analyzed and explanations provided to resolve water quality questions.

c) Alternatives to OSM mapping requirements were presented which required evaluation of map scales and information depicted. This analysis resulted in concurrence with the state alternative.

d) The use of professional or licensed land surveyors to prepare all mine permit application requirements was requested. A technical review of the regulations and Act indicated that while some requirements may be prepared by land surveyors, several require registered professional engineers. The recommendation was made that the land surveyor license statute identify what can be prepared by surveyors.

Question: How much staff effort is required on an average to accomplish an MPR review?

Answer: It takes about 3/4 of a person year to complete the MPR with an EA. However, if an EIS is required the staff effort to process an MPR will increase to 1-1/4 person years.

Question: How can you decrease the request by 42 percent when the workload decline does not drop as precipitously?

Answer: As we have gained experience in the mine plan review process, particularly in concurrent technical and National Environmental Policy Act reviews our efficiency and productivity has improved.

Question: At OSM-28, OSM expects to have 6 staff years of effort in Fiscal Year 1983 to support the Department of Justice and the Solicitor in litigation involving the regulatory program. What level of support are you providing to the Department of Justice and the Solicitor in Fiscal Year 1982?

Answer: The level of assistance provided to the Solicitor and the Department of Justice in litigation involving the regulatory program is expected to require approximately six staff years of effort in Fiscal Year 1982.

Question: A December 29, 1981 press release describes the first in a series of technical memoranda aimed at assisting mine operators and state agencies. The first publication is "Drainage or Road Structures in Backfilled Material in Steep Slope Areas." How often will this publication be issued?

Answer: Technical memoranda are issued at the discretion of the Assistant Director, Technical Standards and Research as, issues arise and guidance is required.

Question: What is the distribution of the publication?

Answer: Technical memoranda are published in the Federal Register and copies, for distribution upon request, are sent to each Technical Center and State Office. Copies are routinely sent to State Regulatory authorities.

Question: How are the topics chosen?

Answer: OSM's technical staff continuously evaluates the specific problems in light of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.), permanent program regulations, technical literature and on-the-ground experience. Technical memoranda are then developed which suggest methods, designs or tests which OSM believes present solutions to the problems. These memoranda formalize and make publicly available end results of OSM's ongoing evaluations of ways to resolve specific mining or reclamation problems.

## General Administration

Question: The budget for Fiscal Year 1983 has a new category to cover administrative expenses. Where is the activity budgeted in Fiscal Year 1982?

Answer: The Regulatory and Issues Management staff unit is a Fiscal Year 1983 addition to the Office of the Director. Previously, this unit was budgeted for in the Assistant Directorate of Management and Budget. It was then a part of the Division of Information and Records Management.

Question: How much is budgeted in Fiscal Year 1983 for implementation of the proposed new financial management system?

Answer: In 1982, OSM assumed responsibility for operating our own financial management system. Previously, OSM paid the Bureau of Mines to provide us with financial and accounting services. The amount budgeted in Fiscal Year 1983 is $1,100,000.

Question: Provide for the record a breakdown of the $4,500,000 requested for general services and compare it to the Fiscal Year 1982 level.

Answer: The following is a table comparing general services in Fiscal Year 1982 and Fiscal Year 1983. The "miscellaneous" account finances OSM-wide expenses such as freight charges and storage costs; contracts for moving and storage of office furniture and equipment; Federal Express and Western Union; shuttle bus services; rental and purchase of word processing equipment and other office machines and maintenance contracts for this equipment. It also provides for numerous other services such as contracts with office supply companies,
carpet service, lock and safe services, and other general administrative services most efficiently budgeted for in one account.

| | Fiscal Year 1982 | Fiscal Year 1983 |
|---|---|---|
| Standard Level User Charges (SLUC) | 1,100,000 | 990,000 |
| Telephone (FTS) | 295,000 | 325,000 |
| Departmental Assessments | 140,000 | 122,000 |
| Postal Services | 350,000 | 380,000 |
| Vehicle Acquisition | 215,000 | 170,000 |
| Miscellaneous | 634,900 | 632,000 |
| Bureau of Labor-Emp Comp | 2,000 | 2,500 |
| Employee Relocation | 700,000 | 300,000 |
| Federal Employee Parking | 8,100 | 6,000 |
| Feeder Group II | 10,000 | 10,000 |
| On-Site Training | 20,000 | 20,000 |
| BOM Agreement | 1,100,000 | 1,100,000 |
| Printing | 148,000 | 150,000 |

| | Fiscal Year 1982 | Fiscal Year 1983 |
|---|---|---|
| Bureau-Wide Training | 63,000 | 65,000 |
| SES Bonus | 50,000 | 55,000 |
| GSA Work Auth | 90,000 | 90,000 |
| Copy Machine | 45,000 | 50,000 |
| Vehicle Maintenance | 2,000 | 2,500 |
| Federal Register CFR | 27,000 | 30,000 |
| SLUC Backup | | |
| TOTAL | 5,000,000 | 4,500,000 |

Question: Provide for the record the details of the $1,131,000 decrease for the Office of the Assistant Director for Management and Budget.

Answer: Decreases in the Directorate of Management and Budget totaling $1,131,000 between the Fiscal Year 1983 base and the 1983 request are as follows:

- o The separation of the evaluation component from the "Planning and Evaluation" subactivity and transfer to the Office of the Director. ($240,000 and 5 FTE's)
- o Transfer of personnel and the component dealing with records management to the Director's Office in a new unit called Regulatory and Issues Management. ($430,000 and 7 FTE's)
- o Transfer of an economic analysis component to Technical Support from Administrative Services. ($260,000 and 5 FTE's)
- o An additional reduction as a consequence of program reductions in management services due to the overall reduction in programs. ($201,000)

Question: The Fiscal Year 1983 request shows 10 new positions for the Office of the Assistant Director for Program Operations and Inspection, including two deputies.

-- How are these positions provided for in Fiscal Year 1982?

Answer: The Assistant Directorate of Program Operations and Inspection combined three former assistant directorates: State and Federal Programs, Inspection and Enforcement, and the Abandoned Mine Lands Program. The Assistant Director, State and Federal had a staff of 3; the Assistant Director, Inspection and Enforcement had a staff of 4; and the Assistant Director, Abandoned Mine Lands had a staff of 3. These personnel were included in the program subactivity budgets for Fiscal Year 1982 and thus do not appear in the Fiscal Year 1983 "base" for General Administration. The new Directorate will have the OSM State Office Directors report to the Assistant Director through his Deputy Assistant Directors for the West and the East.

## Abandoned Mine Reclamation

Question: Annual receipts of the Abandoned Mine Reclamation Fund have exceeded the amounts appropriated for several years.

-- Given this level of unrequested, unappropriated receipts and the fact that inflation devalues the receipts, why does the Administration not move at a faster rate to take care of the problems that we know exist?

Answer: Without approval of regulatory and reclamation programs, States have not been in a position legally to assist in reclamation work through AML grants. In order to expedite the approval procedure, OSM has been processing regulatory and reclamation programs simultaneously. Twelve States now have legal capability to perform reclamation work through AML grants and an additional four are awaiting regulatory primacy. Three additional States have submitted AML plans for review.

As these States gain the legal status necessary for receiving reclamation grants, they are building capability for accomplishing project work. As States demonstrate capability for reclamation work, States will be in the position to reduce the unappropriated receipts.

Question: How has OSM consolidated the Bureau of Mines activities into its organization structure?

Answer: All 52 Bureau of Mines personnel were transferred to OSM on March 21, 1982 and, except for one administrative support person, were incorporated into OSM's existing Federal Reclamation Program organization. There were no geographic displacements. The breakdown includes:

| | |
|---|---|
| 7 | Bureau of Mines headquarters staff to OSM headquarters staff, one of whom is a contract specialist |
| 35 | Wilkes-Barre/Schuylkill Haven employees placed under management of Eastern Technical Service Center in Pittsburgh |
| 8 | Pittsburgh employees under management of Eastern Technical Service Center |
| 2 | Denver Bureau of Mines employees to OSM's Western Technical Service Center in Denver |

Program functions and responsibilities originally performed by Bureau of Mines reclamation personnel continue, except that several transferred employees are now involved in investigating and correcting emergency problems and in managing reclamation project cooperative agreements.

Question: Since this change was announced in February after the budget was submitted, what budget adjustments have to be made to accommodate the organizational transfer?

Answer: Primary adjustments are to close out many individual project and program management accounts in the Bureau of Mines, a process not yet completed. Unobligated balances are then being transferred to OSM. Since the mines work was primarily financed by transfers from OSM it does not appear that any budget changes requiring Congressional consideration will be necessary.

Question: What is the status of the $16,000,000 appropriated to the Bureau of Mines for abandoned mine reclamation work? Provide for the record a list of the projects to be accomplished with the $16,000,000 made available to the Bureau of Mines in Fiscal Year 1982.

Answer: Following receipt of Departmental Solicitor's finding that the $16,000,000 did not have to be transferred to the Bureau of Mines as a result of program consolidation, OSM has been obligating project expenditures against the funds. A list of the projects to be funded with the $16,000,000 and their status follows:

Projects for Funding with $16 Million Designated Bureau of Mines Fiscal Year 1982 Appropriation

| Project | State | Funds | Delivery Mechanism | Remarks |
|---|---|---|---|---|
| Puritan Lando Refuse Area | WV | $ 280,000 | Federal Contract | Contract by 8/82 |
| Copperas Fork Refuse | WV | 370,000 | Federal Contract | Contract by 8/82 |
| Clarksburg | WV | 500,000 | Federal Contract | Active project |
| 16 Shaft Seals in Anthracite Region | PA | $ 555,000 | Federal Contract | Carry over into FY 83 |
| Hyde Park Subsidance | PA | 600,000 | Federal Contract | Drilling contract by 9/82 |
| Olyphant Subsidance | PA | 400,000 | Federal Contract | Drilling contract by 9/82 |
| Sixth Avenue South Scranton | PA | 2,600,000 | Federal Contract | Flushing contract by 9/82 |
| Philo Street Mine Fire | PA | 2,200,000 | Federal Contract | Active contract |
| Centralia Mine Fire | PA | 850,000 | Cooperative Agreement | Project to begin 7/82 |

## Projects for Funding with $16 Million Designated Bureau of Mines Fiscal Year 1982 Appropriation

| | | | | |
|---|---|---|---|---|
| Big Fork | KY | 600,000 | Cooperative agreement with State | To be signed by July 1, 1982 |
| Big Creek Phase III | TN | $ 1,750,000 | Cooperative Agreement with State | To be signed by 9/82 |
| Middle Fork of Duck Creek | OH | 400,000 | Cooperative Agreement with State | To be signed by July 15, 1982 |
| Sunnybrook #2 | IL | 675,000 | Cooperative Agreement with State | Briefing paper to be approved by July 1, 1982 |
| Coal Bluff Refuse | IN | $ 425,000 | Cooperative Agreement with State | Contract by 9/82 |
| Ceader Run | MI | 320,000 | Cooperative Agreement with State | Awaiting Cooperative Agreement from State |
| Jordano | MO | 125,000 | Cooperative Agreement with State | Contract by 9/82 |
| Parker | OK | 300,000 | Cooperative Agreement with State | To be signed by 10/82 |
| Saw Mill Run Phase I | MO | 300,000 | Cooperative Agreement with State | Cooperative Agreement by 9/82 |
| Marshall Mine Fire | CO | $ 1,500,000 | Federal Contract | Drilling and Contruction Contract by 11/82 |
| Vernal Mine Fire | UT | 1,250,000 | Federal Contract | Drilling by 10/82 |
| | | $16,000,000 | | |

## State Reclamation Program Grants

Question: Provide for the record, on a State by State basis, obligations by the States during the first half of Fiscal Year 1982.

Answer: 1982 Awards with 1982 obligations

| State | (Obligation) Total of the Award | (Liquidation) Drawdown |
|---|---|---|
| New Mexico | 438,715 | - 0 - |
| Virginia | 7,689,005 | 82,400 |

1981 Awards with 1982 obligations

| State | (Obligation) Total of the Award | (Liquidation) Drawdown |
|---|---|---|
| West Virginia | 2,997,605 | 206,652 |

Question: What ratio of State reclamation staff to dollar awards do you recommend for the State reclamation programs? How well have the States met this recommendation?

Answer: OSM does not recommend to the States a ratio of staff to dollars. When the State abandoned mine land reclamation plan is reviewed, the plan must provide for necessary staff availability to conduct the reclamation program or for contracting for the necessary expertise.

When the plan is approved, OSM grants exclusive responsibility and authority to implement the provisions of the approved program and OSM does not dictate to the State the number or type of staff they must employ in the program. This will be an item in the evaluation (oversight) of the State reclamation programs that will be examined.

Question: What portion of the $78,500,000 request for State Reclamation Grants is for State administrative expenses?

Answer: Based on ten grant applications received to date for both administrative and construction grants the figures would be:

| | Amount | Percent (average) |
|---|---|---|
| Administrative | $ 8,793,877 | 13.75 |
| Construction | 55,134,800 | 86.25 |
| TOTAL | $63,928,677 | 100.00 |

Question: One method OSM has used to get reclamation money to States before reclamation programs have been approved are cooperative agreements. In total, the budget justification indicates on page OSM-78 that $49,576,000 has gone to the States through cooperative agreements .When were these awards made?

Answer: These awards began in Fiscal Year 1979. A complete computer printout is provided for the Committee. A summary by State and by time periods is shown on the following page.

Question: Provide for the record details of the obligations incurred by the States in using funds made available by cooperative agreement.

Answer: As of April 15, 1982, 206 cooperative agreements have been executed for a total obligation of $50,332,634. As of December 31, 1981, $16,147,169 have been expended or 32.1 percent of the total obligated. Discussions with the State reclamation agencies encourage OSM to believe that major expenditures will occur this spring as the construction season begins.

Question: Provide for the record the staff resources each State currently has and plans to have in Fiscal Year 1983 to operate the State reclamation grants.

Answer: Following is a table showing the number of employees currently on board in each State with an approved reclamation program. For the most part, these States are not anticipating changes in reclamation staffing in Fiscal Year 1983; the same staff which has been accomplishing reclamation project work through cooperative agreements in the past will be performing reclamation work through State grants in Fiscal Year 1983.

| State | # Employees |
|---|---|
| Alabama | 27 |
| Colorado | 9 |
| Illinois | 22 |
| Kentucky | 52 |
| Missouri | 6 |
| Montana | 5 |
| New Mexico | 2 |
| Oklahoma | 7 |
| Tennessee | 11 |
| Texas | 7 |
| Virginia | 15 |
| West Virginia | 26 |

Question: Provide examples of state quarterly progress reports for the committee files.

Answer: Under current regulations approved construction grants do not require quarterly progress reports, only yearly reports. Since no grant has been in effect for the year, no reports are available. OSM is changing the regulations to require semi-annual reports.

## Reclamation Fund Management

Question: How do the reclamation fund management activities budgeted in the Abandoned Mine Reclamation Fund differ from the activities proposed to be funded in the General Administration activity in the Regulation and Technology account?

Answer: The Fund Management subactivity is responsible for specific functions within the Abandoned Mine Land appropriation: management of fee compliance, maintenance of the National Inventory, management of reclamation grants to States and Indian tribes, and national reclamation program planning.

General Administration, on the other hand, provides for expenses incurred for support of all activities in both appropriations: policy and program direction, procurement, data processing support, budgeting, personnel functions, property and space management, communications and ADP systems development support. Also included are fixed expenses such as office space, postage, printing, general purpose vehicle maintenance and replacement, and interagency agreements for general administration.

## Interior Reclamation Projects

Question: What is your estimate of the unfunded high-priority nonemergency projects on Federal lands and in States without approved Federal Programs?

Answer: The National inventory does not contain the capability of differentiating among land ownerships. States were requested to inventory all lands within their boundaries; the submitted information was spot-checked, prioritized by National criteria and coded. Land inventory data also exists in other Federal agencies, including Bureau of Indian Affairs, Bureau of Land Management, Soil Conservation Service, and Forest Service. Coordination of information on Federal lands among these agencies must take place before a more definitive identification can be made. An account of high priority, nonemergency projects for States without approved programs is as follows:

| State | Problem Areas | Estimated Cost ($ in millions) |
|---|---|---|
| Georgia | 21 | $2.5 |
| Michigan | 31 | .5 |
| Rhode Island | 1 | 2.1 |
| Washington | 2 | 1.6 |
|  | 55 | $6.7 |

These 55 problem areas represent 1.5 percent of the nationwide total of 3,797 non-emergency projects identified as of May 3, 1983. Included in the 55 problem areas are 9 Priority 1 projects, or 2.2 percent of the nationwide total of 426 Priority 1 projects.

Question: What is the reason for not requesting any funds to undertake any new high priority nonemergency projects on Federal lands and in States without an approved State abandoned mine land program?

Answer: The Fiscal Year 1983 budget request for Interior Reclamation projects reflects our intention to turn over primary responsibility for abandoned mine reclamation to the States. Although there is a proposed decrease in this subactivity, there is also a proposed increase in State reclamation grants. All major coal-producing States are expected to have primacy by Fiscal Year 1983 and will have capability for accomplishing nonemergency projects on both Federal and non-Federal lands. In Fiscal Year 1983 OSM will be applying its AML resources toward accomplishing emergency projects.

This agency is currently developing a formula for the future allocation of the Secretary's discretionary share of the AML fund. This formula will base allocations of funding partly on the amount of reclamation work to be performed. At a later date the workload of non-emergency projects on Federal lands and in States without an approved AML program may be accomplished by States or OSM depending upon distribution of the funding.

Question: If you do not undertake any new high priority projects in Fiscal Year 1983, when will you request funds for nonemergency projects on Federal lands and States without approved State programs?

Answer: OSM does not anticipate requesting funds for non-emergency projects on Federal lands utilizing the Federal delivery mechanism. In the future, funds from the Secretary's discretionary share of the AML fund will be requested and made available through the State grant mechanism. States can address abandoned mine land problems within the State, including reclamation funding from this source, through abandoned mine lands cooperative agreements for those problems on Federal lands. Because of checkerboard land ownership in the Western States, it is believed that this method would be more effective both administratively and financially by having the States develop and manage a comprehensive reclamation program within their borders. Major problems would be resolved by the State without jurisdictional or setting-of-priority conflicts. This benefit holds true for Eastern as well as Western States. In States without approved State programs, OSM will continue to provide response to emergency situations. These States will always have the opportunity to develop a State regulatory/reclamation program and to apply for State primacy.

Question: Are you in effect proposing a one-year moratorium on new starts in order to work off the funds provided in previous years?

Answer: No, we are not. Rather, OSM will move with dispatch to obligate and expend existing nonemergency funds. Future non-emergency work will be funded through grants to States.

Question: How much appropriated in prior years will carry over into Fiscal Year 1983?

Answer: Funds appropriated in prior years for nonemergency reclamation projects, exclusive of funds passed through to the Bureau of Mines, are expected to be totally obligated in fiscal year 1982. Of approximately $12M unobligated by the Bureau on the date of transfer to OSM, approximately $5M will carry into fiscal year 1983.

Question: What is the basis for the estimate of $9.4 million for emergency projects in Fiscal Year 1983?

Answer: The funds requested are founded on the number, type and cost of emergency situations addressed in fiscal years 1980 and 1981. Consideration was also directed toward the increase in the number of more complex problems such as mine land subsidence.

Question: How does the Fiscal Year 1983 request for emergency projects compare to the Fiscal Year 1981 and Fiscal Year 1982 experience?

Answer: The obligations for emergency projects are shown in the table below. These amounts are for project contracts only and do not include the Federal staff costs. Exclusive of staff costs the Fiscal Year 1983 request provides $6.4 million for projects:

| Fiscal Year | Project Obligations |
|---|---|
| 1980 | $ 3.7 M |
| 1981 | 10.1 M |
| 1982 | 3.4 M 1/ |

---

1/ As of April 1982

Rural Abandoned Mine Program

Question: Please trace for the Committee how the RAMP appropriation gets translated into on-the-ground work. For example, how many layers must the money pass through in order to get to where the work is actually performed?

Answer: Funds for the Rural Abandoned Mine Program are initially appropriated to the Department of Interior and then transferred on an annual basis to the National Office of the Soil Conservation Service. These funds are then allotted to those State Offices of the SCS where there are active RAMP contracts based on State planning requests. Funding priorities for individual contracts are established at the SCS State Office level after an initial determination by the local (county-level) SCS office as to which applications are high priority (those addressing active hazards to public health and safety). These applications are then reviewed at the State level with the State Reclamation Committee, consisting of both OSM and State reclamation representatives, to verify that assigned priorities are in accord with the law and in line with other State reclamation activities before funding is approved.

Actual on-the-ground reclamation work including plan development, contract supervision, and performance certification is then provided by the local SCS field office staff in the area where the actual reclamation occurs. However, reclamation payments are made directly by the SCS State Offices either to the contractor or to the landowner involved as the plan is implemented.

Question: Would you recommend through your oversight of State reclamation grants funds to contract with State/RAMP committees or local conservation districts?

Answer: The Office of Surface Mining recommends that the States use the most cost effective mechanisms to reclaim abandoned mine lands and also recognizes that in many cases the local conservation districts will be the most effective mechanisms.

Question: How do RAMP administrative costs compare with those associated with State reclamation grant costs and Interior reclamation projects administration costs?

Answer: A direct comparison is difficult because of different definitions of the term "administration" and differences in accounting systems. Variations between agencies and between years are also heavily influenced by the total dollar level of the programs--in general administrative expenses decrease as a percentage of the total as the programs increase. With these limitations in mind the data available indicates that the States' "administrative" costs of 13 to 14 percent will be substantially lower than any of the Federal programs. In the past, available data indicates that the total non-contract cost per Interior projects (25 percent range) was significantly lower than RAMP non-contract costs (40 percent range). The Interior project program has been larger, and the Department of Agriculture attributes its high percentage of non-contract costs to a less than optimum program level.

## Lapsed Appropriations

Question: According to the program and financing schedule on page OSM-47 of the justification, $19,832,000 of the $89,679,000 appropriated for Regulation and Technology in Fiscal Year 1981 was lapsed. Please provide the Committee with a complete, detailed explanation of why the money lapsed.

Answer: The following is a table showing lapsed amounts by budget activity and subactivity:

| Activity/Subactivity | Amount Lapsed ($000) |
|---|---|
| State Regulatory Grants | 2,436<br>5,800 (deferred) |
| State and Federal Programs | 10,385 |
| Inspection and Enforcement | 730 |
| Technical Services | 169 |
| Mineral Institutes | 312 |
| TOTAL | 19,832 |

In the State Regulatory Grants activity, the $2,436,000 in lapsed funding and the deferral of $5.8 million to Fiscal Year 1982, are attributable to the fact that major coal-producing States had not attained primacy as anticipated.

The lapsed amount in the State and Federal Program subactivity is primarily attributable to a slow-down in the awarding of mine plan review cooperative agreements during calendar year 1981. The process of receiving and reviewing new mine plans for Western mines on Federal lands has been changed to increase the role of the States under cooperative agreements and the timetables have been extended. Secondarily, we experienced a heavy turnover in staff due to an extended period of uncertainty over the location of the new Western Technical Service Center and some staff effort was diverted to regulatory reform.

A personnel freeze coupled with a delay in implementing the planned reorganization in the Western States was primarily responsible for the unobligated balances in the other activities. During the period when the OSM reorganization was delayed, a significant number of employees left the organization, causing lower than anticipated obligations for salaries and related expenses. The hiring freeze imposed on OSM because of the pending reorganization precluded filling of the abnormally high number of vacancies.

Questions Submitted by Congressman Murtha

Question: The Fiscal Year 1983 budget justifications include funds for the Rural Abandoned Mine Program (RAMP) administered by the U. S. Department of Agriculture. What role did USDA have in developing this material?

Answer: The 1983 budget justification material for the RAMP program was developed entirely by the Office of Surface Mining using data previously supplied by the Department of Agriculture.

Question: What did the USDA Soil Conservation Service propose for RAMP for Fiscal Year 1983?

Answer: The Soil Conservation Service's Fiscal Year 1983 budget request for the RAMP program as submitted to the Office of Surface Mining on April 15, 1981, proposed a funding level of $60 million which provided for approximately 203 new contracts on 4,304 acres.

Question: Since USDA was not involved in developing the justification for this program, I would like your opinion on some of the statements I have seen in that material. Do you agree with the statement on OSM-51 that "new project financing, therefore, is expected to come from the State Reclamation Grants activity through cooperative agreements between the States and SCS?

Answer: The SCS supplied the following answer: "We do agree that SCS could obtain financing for new reclamation projects on rural abandoned mine lands through reimbursable agreements with the States once they have an approved reclamation plan and have received their reclamation program grant funds from the Department of the Interior. As of early May of Fiscal Year 1982, only 3 of the 20 States where RAMP is active had actually received reclamation funds. Any new work will be delayed until these funds become available. In addition, future commitments for new RAMP projects under reimbursable agreements would depend upon the availability of adequate SCS staff to carry out this work. Staffing levels for the RAMP program are currently declining in line with the budget decision to discontinue all new contracting and to phase out this program."

Question: On OSM-60, paragraph 3, it states that, "It is essential, therefore, that all aspects of the reclamation program, including the State grants activity, be effectively managed to accomplish the highest priority work without waste, inefficiency, or misuse of funds." 1. Please address each of the following questions in terms of improved efficiency, reduction of waste, and misuse of funds. (a) How many of the States, in which RAMP is operational, are now eligible to receive Abandoned Mine Land (AML) grant funds?

Answer: Twelve States are now eligible to receive AML State reclamation grants. It is expected that twenty-four States will be eligible to receive reclamation grants in Fiscal Year 1983. It is possible that three reclamation programs will exist in each State resulting in administrative overlap and duplication of effort.

Question: (b) How many of these States have actually received grants and will carry out reclamation in Fiscal Years 1982 and 1983?

Answer: As of June 1, 1982, twelve States have requested reclamation grants, seven of which actually received funds. In Fiscal Year 1983, twenty-four States are expected to receive reclamation grants.

Question: (c) How many of the States with eligible abandoned coal lands intend to achieve primacy and develop a reclamation plan to become eligible for grants?

Answer: Twenty-four States and three Indian tribes are expected to have an approved State reclamation program and be eligible for grants in Fiscal Year 1983.

Question: 2. In view of the low level of State activity actually underway, how do you explain the "efficiency" of shutting down the ongoing RAMP and incurring start up costs and costly delays in going to a State grant program?

Answer: The State reclamation programs, which are mandated by the Act, are not inactive despite the lack of grant funds. The States' reclamation programs have undertaken $50 million in projects for OSM through cooperative agreements which have been financed from the Federal discretionary share of the Fund.

The RAMP is not being shut down, but rather it is planned that direct funding for RAMP through the Secretary of Agriculture will be phased out by Fiscal Year 1986. The States will be eligible to receive supplements to their grants to undertake reclamation projects on rural lands. The States will have the option of utilizing the State RAMP committees or the local conservation districts to reclaim rural abandoned mine lands.

Efficiencies will be obtained by decreasing Federal administrative costs which duplicate the States' while continuing to utilize local reclamation resources which are efficient.

Question: 3. How does the OSM/USDI justify leaving high priority reclamation plans, which are ready or nearly ready for construction start, lying idle on the shelf while inflation erodes the AML Fund and the States are not yet ready to use the funds? Could you provide a list of the plans that are in this situation?

Answer: Although the OSM has proposed a new mechanism for funding RAMP projects, this should not cause additional delays in the initiation of project construction. Some States have already taken actions to incorporate the designed projects into their reclamation programs and we expect this trend to continue.

Question: 4. Who will now handle the high priority applications for the RAMP reclamation assistance made in faith by our constituents?

Answer: It is expected that projects will be undertaken directly by the State reclamation programs or through cooperative agreements with local conservation districts.

Question: 5. Did the Office of Surface Mining give any consideration to the preceding before proposing to eliminate new contract funds for the RAMP?

Answer: The Office of Surface Mining considered many factors including those mentioned before proposing consolidation of the funding mechanisms.

Question: 6. What consideration was given to phasing RAMP out gradually as the States became eligible, ready, willing and able to pick up the RAMP workload?

Answer: The alternative of continuing some new project starts under the existing mechanisms for an interim period was considered, both in the case of the RAMP and for high priority Interior projects. The decision to propose no new starts for RAMP and no non-emergency high priority Interior projects was based on overall budget constraints and priorities as well as the fact that the State programs will be fully operational in Fiscal Year 1983.

Question: On page OSM-85 it states "the RAMP uses Washington and field SCS structure to coordinate the various State and local RAMP committees. State abandoned mine land agencies have little or no role. This approach does not assure that individual State needs and priorities are met." Two paragraphs later, it is stated, "OSM is convinced this plan will eliminated the conflict that now exists in setting priorities according to national needs."

These statements make some rather strong implications. Similar "justification" statements are repeated in USDI's February 1, 1982, letter to Senator McClure which recommends RAMP be discontinued as a delivery mechanism for using AML funds.

I assume that you have data that supports these statements. However, information I receive from the States where RAMP is active indicates SCS judiciously involves the State Reclamation Agency, and strictly follows legislated priorities. (a) What is the basis for implying RAMP has a different priority system than the Office of Surface Mining or the States?

Answer: RAMP has several unique features which makes it more exclusive in the selection of projects and less widely applicable than the other reclamation programs. The Soil Conservation Service provides technical assistance and long term financial cost sharing assistance to land-owners of woodland, pasture, cropland or noncommercial recreation land. The main objectives of the RAMP are the control and prevention of erosion and sediment damages from reclaimed mined lands. The State grant program can and will address the full range of priorities outlined in section 403 of the Act.

Question: (b) Do RAMP contracts fail to address danger to life and property or public health and safety?

Answer: RAMP's primary objectives are the control and prevention of erosion and sediment damages on a cost-sharing basis to private landowners. RAMP reclamation is limited to woodland, wildlife habitat, range or pasture and other rural areas. This process does not always address danger to life and property or public health and safety.

Question: (c) Does RAMP fail to use the priority system specified in the law?

Answer: RAMP applies its interpretation of the statute's priorities. OSM's position is that the basic nature of the RAMP parallels priority 3 of the Act--the restoration of land and water resources.

Question: (d) Does RAMP fail to consider AML inventory information where it is available?

Answer: Since the RAMP program is based or landowner or land user applications, the inventory is not directly applicable to project selection.

Question: (e) What is the basis of indicating conflict exists between RAMP and the States? Isn't RAMP coordinating all work through a State RAMP or Reclamation Committee on which OSM and the State are members?

Answer: The conflict or competion, referred to exists between all the reclamation programs and was not directed to a specific program. Whenever there are limited resources and varying interest, competition or conflicts will exist. This condition is evident throughout the budget process. OSM's plan to consolidate delivery mechanisms will decrease this inherent conflict of priorities and competition for funds by giving the States the lead role in reclamation activities.

Question: One of the reasons OSM presents for phasing out RAMP is its high overhead costs. Please define as you use it in your testimony.

Answer: The terms administrative expenses, overhead, indirect costs, and technical assistance have the same general connotations. Generally, the OSM defines administrative costs as all those expenses incurred in the direction, control and administration of the program. This would include all costs incurred by agency personnel and support but excludes construction costs for undertaking of the reclamation projects. In our letter to Congressman Yates, dated February 1, 1982, we indicated that our intent is to reduce Federal administrative costs (including overhead). OSM belives that phasing out direct appropriations for RAMP and providing the option to the States to establish agreements with the local soil conservation districts or RAMP committees is the most cost effective means of utilizing Federal funds and also reduces the Federal administrative budget.

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### COOPERATIVE AGREEMENTS
### AWARDED BY STATE BY FISCAL YEAR

| States | 1979 |  | 1980 |  | 1981 |  | [illegible] |  | Balance to be Expended |
|---|---|---|---|---|---|---|---|---|---|
|  | Cooperative Agreement Obligated | Expended | Cooperative Agreement Obligated | Expended | Cooperative Agreement Obligated | Expended | Cooperative Agreement Obligated | Expended |  |
| Alabama | 424,738 | —— | 312,149 | 375,194 | —— | 135,892 | 281,255 | 18.356 | 488,720 |
| California | —— | —— | —— | —— | 31,858 | 31,858 | 113,000 | —— | 113,000 |
| Colorado | 69,834 | —— | —— | —— | —— | 69,834 | —— | —— | -0- |
| Illinois | 259,329 | 69,259 | 1,426,488 | 404,404 | —— | 931,320 | 1,153,103 | 34,088 | 1,999,849 |
| Indiana | —— | —— | —— | —— | —— | —— | 130,744 | —— | 130,744 |
| Kentucky | 1,427,361 | 869,467 | 8,620,197 | 574,977 | —— | 322,030 | 594,802 | 386,368 | 8,557,518 |
| Maryland | 1,000,443 | 917,658 | 119,288 | 95,923 | —— | 106,126 | —— | —— | -0- |
| Missouri | —— | —— | 4,218,000 | 3,674 | —— | 411,130 | —— | —— | 3,803,196 |
| Montana | —— | —— | 437,089 | 37,000 | —— | 145,728 | —— | 80,490 | 194,671 |
| New Mexico | 19,136 | —— | 285,178 | 19,136 | —— | 263,507 | —— | 1,671 | -0- |
| North Dakota | 235,750 | —— | 657,587 | 217,000 | —— | 498,336 | —— | —— | 177,981 |
| Ohio | 491,168 | 81,948 | 3,270,340 | 693,118 | —— | 2,091,883 | 757,641 | 213,026 | 1,439,176 |
| Oklahoma | 28,024 | —— | 118,000 | 28,024 | —— | 45,005 | —— | 1,391 | 71,604 |
| Pennsylvania | 3,340,860 | 81,730 | 7,317,088 | 206,599 | 1,238,128 | 1,351.779 | —— | 100.712 | 10,161,269 |
| Rhode Island | —— | —— | —— | —— | —— | —— | 83,000 | —— | 83,000 |
| Tennessee | 153,560 | 70,000 | 157.478 | 79,699 | 103,174 | 173,599 | —— | —— | 90,906 |
| Texas | —— | —— | 758,968 | 78,535 | —— | 74.543 | —— | —— | 605,882 |
| Virginia | 1,371,077 | —— | 2,836,348 | 1,205,013 | 77,631 | 799,870 | 1,163.615 | 464,871 | 2,980,913 |
| West Virginia | 2,021,319 | 136,000 | 2,879,106 | 160,000 | —— | 991,748 | —— | —— | 3,612,677 |
| Wyoming | —— | —— | 142,033 | 32,000 | —— | 32,839 | —— | —— | 77,196 |
| TOTALS | 10,842,621 | 2,036,062 | 33,744,065 | 4,210,296 | 1,466,792 | 8,677,027 | 4,279,160 | 1,220,971 | 34,188,282 |

Question: Is that definition the same as is used by SCS?

Answer: The Soil Conservation Services uses the term "Technical Assistance" to define all Federal costs associated with support to the program exclusive of "Financial Assistance" which defines costs for actual construction work. Differences between OSM and SCS do exist, not in definition, but rather in the work performed by the agencies and in accounting procedures. The technical work leading to the actual physical reclamation is sometimes handled through contracts by OSM and is considered part of the project cost. The same technical work in RAMP is handled by Soil Conservation Service staff and is considered as technical assistance costs. This has been considered in the recommendations made by OSM.

Question: It is the same as used by OMB?

Answer: OMB, to our knowledge, has not rendered a special definition for administrative costs, but rather has utilized definitions furnished by OSM and SCS.

Question: Please provide a copy of any studies that compares RAMP "overhead" to the cost of the same activities or factors in the State and OSM operations?

Answer: Evaluation Report #15 on AML Fund Delivery Systems is provided for the Committee's use.

Question: Can you provide to us the percent of funds appropriated to OSM for the OSM and State Reclamation program from Fiscal Year 1978 through Fiscal Year 1981 that were paid or obligated for payment for actual construction work, exclusive of that which was paid to consultants or others for inventories, environmental evaluations, impact statements, priority determinations, geologic investigations, reclamation planning and design, construction supervision, inspection, contract administration and other similar items that were required before the actual construction could be carried out?

Answer: Following is a table showing percentage funds obligated for OSM construction work for Fiscal Year 1978 through Fiscal Year 1981.

Percentage of Funds Obligated for Construction Work

| FY 78 | FY 79 | FY 80 | FY 81 |
|---|---|---|---|
| 64% | 72% | 84% | 77% |

Reporting of expenditure of grant funds to States is required annually; since the first reclamation grant was awarded less than a year ago, information on percent of funds obligated for construction work from reclamation grant money is not available as yet.

## QUESTIONS SUBMITTED BY CONGRESSMAN REGULA

Question: In last year's hearings you estimated that Ohio's State plan would be in effect by February 1, 1982. Now you are estimating July or the end of the fiscal year. What specifically is the hold up in getting Ohio's plan for State primacy approved?

Answer: Ohio's program submission of March 3, 1980 was disapproved by the Secretary of the Interior on October 1, 1980. Ohio then had sixty days to submit a revised program for consideration. Ohio was to submit its revised program on December 1, 1980. However, the State was enjoined by two State courts from resubmitting. These injunctions were not lifted until November 25, 1981. Ohio resubmitted its program to OSM on January 22, 1982. The Secretary's approval is expected in early July.

The Ohio State program, like the other State programs, is very complex and the review process has entailed resolution of several hundred issues. OSM has had to provide the State time in which to make the required responses. In addition, OSM provided additional time for public review and comment after each response.

Question: Your Fiscal Year 1982 request for the Rural Abandoned Mine Program (RAMP) of $4.3 million, according to your testimony last year, would not have allowed for any new contracts. Less than $1 million was ultimately added to that request for RAMP in Fiscal Year 1982. Your Fiscal Year 1983 budget request of $3.7 million also would provide for no new starts and is sufficient only for continuation of projects initiated in prior years. If this budget request is approved would that mean that no new RAMP projects have been initiated since Fiscal Year 1981? When were the last new RAMP projects initiated? How many projects have been undertaken and how many acres reclaimed through RAMP since the programs inception? How many priority 1 and 2 projects are still eligible for RAMP assistance that have not been funded?

Answer: The Soil Conservation Service has received from eligible landowners 3,009 applications for assistance under the Rural Abandoned Mine Program. The Soil Conservation Service has signed 244 contracts amounting to $20.3 million to reclaim 4,483 acres of land. No new RAMP projects have been funded since Fiscal Year 1981. The Soil Conservation Service has estimated that in Fiscal Year 1983 244 projects will be active, of which 104 will be in a major construction stage.

Applications for 1,568 priority 1 and 2 projects are pending funding through RAMP. Of this total, planning is over ninety percent complete for 122 projects whose estimated cost is $25.9 million.

Question: Last year we directed Interior to accelerate reclamation and use the rapidly depreciating sums that have been collected and remain unappropriated in the Abandoned Mine Reclamation Fund. It would appear from your Fiscal Year 1983 budget that no effort has been made to do so. In fact, total requested appropriations from the fund are down $4.4 million from $102.1 million appropriated in Fiscal Year 1982 to $97.6 million requested in Fiscal Year 1983. Since your budget assumes most States will have primacy by the beginning of Fiscal Year 1983 why is the reclamation not being accelerated and what action has been taken to comply with the directive in last year's report accompanying the Interior Appropriations bill?

Answer: The proposed decrease in the Abandoned Mine Land (AML) Fund is attributable to the reduction in Federal program activities. However, this decrease is partially offset by a proposed increase of $19.4 million in the State Reclamation Grants Activity, reflecting the Administration's intent to reduce the Federal role and accelerate reclamation through grants to the States.

Prior to approval of their regulatory and reclamation programs, States could not legally receive AML grant funding. In order to expedite the approval procedure, OSM has been processing regulatory and reclamation programs simultaneously.

Question: I am aware that objections to the RAMP program stem in part from the high per acre cost of these reclamation projects, some of which is unavoidable due to the fact that the tracts are smaller. Some of these high costs, however, seem to be due to high administrative and overhead costs. Because I believe there is still a need for RAMP style projects involving local soil and water districts and the knowledge and technical expertise of the Soil and Water Conservation Service, what would you recommend be done to reduce the administrative costs while at the same time accomplishing the work that RAMP has accomplished in the past?

Answer: OSM proposes to reduce Federal administrative costs by eliminating RAMP funding through the Department of Agriculture and financing RAMP projects through the State Reclamation Grant mechanism. States could contract with their local soil and water conservation districts and the Department of Agriculture's Soil Conservation Service in order to accomplish RAMP projects.

This method would reduce Federal administrative costs and overlap and would ensure that projects are accomplished in conformance with States' reclamation plans. Utilization of Soil Conservation Service technical expertise could be accomplished by use of cooperative agreements with that agency.

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